

1  
2       sxwraoifrjtsz couple of bars for  
3       Mr. Schifferman, could you drop in, corner bar.

4  
5               THE COURT: Please be seated.  
6               Ladies and gentlemen before the first witness  
7       is called by the State, I'm going to read you an  
8       instruction related to taking notes as a you see you  
9       have note pads now.

10              During the course of trial you're permit  
11      to do take notes if you wish by permitting you to take  
12      notes I'm not urging or strurbldgts you to do so. I  
13      caution you that note taking may interfere with your

1  
2      opportunity to observe the demeanor of the witnesses  
3      and other events of the trial.

4              Do not disclose or discuss your notes with  
5      any other juror until the jury begins its deliberation  
6      at that time you may disclose and discuss your notes  
7      with the other jurors if you so desire.

8              When you recess during the trial take your  
9      note pads with you to the jury room.

10             At the end of day leave your pad in the jury  
11      room note pads are not permitted to be taken out the  
12      courtroom or jury room at any time or for any reason.

13             After you have reached a verdict the bailiff  
14      will collect your pads the notes you took will then be  
15      destroyed no one will be allowed to read your notes.

16             Finally I caution you not to assume that any  
17      particular note you may have taken is necessarily more  
18      accurate than your memory or the notes or memories of  
19      your fellow jurors.

20             At all times keep your minds open to the note  
21      s or memories of your fellow jurors.

22             Now ready for plaintiffs first witnessed.

23             MR. LUVERA: David Burns please witness is  
24      sworn witness is sworn.

25      BY MR. LUVERA:

26             Q       Request good morning

1       ?

2       A       Good morning.

3       Q       Tell us who you are?

4       A       Dr. David Michael burns.

5       Q       Dr. Burns the jury almost got it's wish I've  
6      almost loss my joist if you can't hear me tell me?

7       A       Okay.

8       Q       Second thing is I'll use technology I'm not  
9      familiar with be patient with me as I try to fumble my  
10     way through this stuff which I'm not used to?

11      Q       What do you do?

12      Q       Living?

13      A       Approach are arrest smed. yurn  
14      of the skants yaig go school of medicine.

15      Q       Did we came you to come here and talk to the

16 jury about the subjects of smoking and disease and the  
17 history of tobacco?

18 A Yes you asked now to come and explain to the  
19 jury about how smoking causes disease what diseases it  
20 causes and the history of tobacco use and in  
21 particular cigarette use in the United States and this  
22 country.

23 Q Can you hear him all right you want to move  
24 the microphone?

25 (At this time an off-the-record discussion  
26 was held.).

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1 BY MR. LUVERA:

2 Q ?

3 A I tend to tail off at the end of sentences so  
4 if I do that let me know.

5 Q Both have a problem then.

6 Are you married?

7 A I am.

8 Q You have children?

9 A Yes one 14 year old boy.

10 Q To become a physician in the United States I  
11 assume you went to college?

12 A Yes.

13 Q And where did you go to under graduate  
14 school?

15 A Boston college in Boston Massachusetts.

16 Q From there where did you go?

17 A Dartmouth where I served a partner letters of  
18 medical science then completed my medical training at  
19 Harvard served my doctorate of medicine from Harvard  
20 medical school.

21 Q You graduated from her verdict medical school  
22 when?

23 A 1972.

24 Q Now following your completion of medical  
25 training I understand that you were involved in a

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1  
2 program called internship?

3 A That's correct.

4 Q Could you tell us about that and residency  
5 too I guess they go together?

6 A When you complete medical school you have a  
7 great deal the information you know an all of full lot  
8 about how the Bobby word works and how to trite  
9 disease there to flow ream experience that prepares  
10 you for the responsibility of actually making  
11 decisions.

12 What we do in medicine is we super a period  
13 of time that actually fairly long period of time 3,  
14 sometimes for the purpose, five years. Where you do  
15 that in a setting where fl is a detail the  
16 supervision of decisions your making.

17 You have to make the decisions when you sign  
18 an order that order will be carried out but there is  
19 very close supervision no people who are more  
20 experienced, right there with you and internal  
21 supervised is by residents then also there is

22 supervision by the faculty who are watching the care  
23 of the patient and making helping you make the correct  
24 decisions about the way to manage that patient as well  
25 as teaching you about the strategies with which you  
26 provide care to people

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1 .  
2 So I was an internal and resident on the  
3 Harvard medical as far as at Boston city hospital  
4 which is the county hospital in if you will of the  
5 city of Boston for two years and we went through this  
6 process of taking care of patients, struggling to  
7 learn about day-to-day asking people who were more  
8 experienced teach us about that tease cease and  
9 learning about the science and the art of medicine.  
10 Q How many years of college before medical  
11 school?  
12 A Four years of college before medical school.  
13 Q How many years of medical school?  
14 A Four years.  
15 Q How many years of internal hitch away  
16 residence?  
17 A Two years of internship and residency.  
18 Q So that is ten years of training?  
19 A Yes not even done yet.  
20 Q And we're not done.  
21 You must have picked a field of speciality  
22 tell the field of smerk is?  
23 A I elected after I completed my obligation  
24 in the public health service I spent three years at the  
25 university the California San Diego as a fellow in  
26 pulmonary medicine

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1 .  
2 Pulmonary medicine is the study of disease  
3 that is occur in the lung and chest cavity includes  
4 chronic lung disease of variety of types lung cancer  
5 and the management of the patiences who are critically  
6 ill.  
7 I spent three years in that process again a  
8 fellow is a little bit more experienced having been  
9 through the ploiz of internship and residency  
10 you're now at a point where your learning as an  
11 internal and rest depends you learn how to care  
12 for the majority of cares that is very a given disease.  
13 You learn how to manage 90 percent of process  
14 .  
15 As a fellow you tend to specialize in that  
16 ten percent that doesn't behave normally it's at  
17 different where you have to look at the information in  
18 more detail have to be more knowledgeable about the  
19 process by which the disease progesses or by which the  
20 disease may take an abnormal path and be able to  
21 design and implement treatment plans that take  
22 into account the fact that this is not the average or  
23 normal path for this particular disease.  
24 I did that for three years at the university  
25 the California San Diego.  
26 Q I'm sure the jurors know but can you tell us

1  
2 what the field of specialty you picked involves what  
3 is it you do in your field?  
4 A I'm a specialist in pulmonary medicine,  
5 pulmonary medicine specializes in the medical  
6 management the disease the in the chest that is  
7 I don't operate on people I'm not a surgeon what we do  
8 is we manage the care of patients with asthma, chronic  
9 obstructive pulmonary disease, have a variety of  
10 different enteric diseases, shall lung diseases's best  
11 to say which is to occupational disease causes  
12 scarring of the lung also pulmonary tuberculosis  
13 even next to these diseases damages the lungs current  
14 we see a large number of AIDS patients with lung  
15 disease as a companion piece you spend a great deal of  
16 time in the intensive care unit managing apparent the  
17 on mechanical ventilation and have a come  
18 pleurisy and diseases, including diseases like  
19 heart disease, kidney failure and viral of  
20 infectious disease that is make people very critically  
21 ill and necessitate a management and environment like  
22 an intensive care unit where has great deal of  
23 technology is available to provide care.

24 Q Dr. Lums, are you board certified in  
25 your field?

26 A Yes

1 .  
2 Q Could you tell us please what board  
3 certification is why is that significant?  
4 A Well I'm board certified in internal medicine  
5 and pulmonary medicine and I have a board certificate  
6 of special competent in critical care medicine  
7 the reason to the credentialing process to provide  
8 some kind of uniform guarantee about the level the  
9 training and experience that an individual has as  
10 well, as their knowledge when they are offering their  
11 care to the individual patients in order to be board  
12 certified what you have to do is complete a training  
13 program, in internal medicine for example, that  
14 training program has to have been certified by the  
15 board of American board of internal medicine, that  
16 certification requires that they have components of  
17 training in that program and that it meet a standard  
18 of excellence sufficient to provide first level  
19 training to individual medical students who are  
20 training as interns and residents.  
21 Same is true of fellowship programs in order  
22 to sit for the boards and pulmonary medicine you  
23 have to complete two years of fellowship that  
24 fellowship has to have specific components and  
25 training have to be train the in interpretation of  
26 pulmonary function studies for example, lung function

1  
2 trained interpretation of x-rays managing mechanical

3 ventilation, managing take Berkley lose managing a  
4 wide variety of the disease that is are likely to  
5 occur in a setting where an intersection laofrt  
6 would be skod to consult on those patients.

7 At the end of that training you are then  
8 allowed sit for a very comprehensive and often quite  
9 difficult examination that tests how well vow why  
10 absorbed all the lessons of training program if you  
11 have completed both 9 training program and  
12 successfully passed the examination then your board  
13 certified.

14 Q Counter?

15 Q You're board certified in two field are you  
16 not?

17 A Yes board certified in internal medicine and  
18 subspecialty the internal medicine which is pulmonary  
19 medicine.

20 Q In order to become board certified did you  
21 soit written examinations conducted by people  
22 within a specialty feel who will be is there libertied  
23 add sxrsz?

24 A That's correct the examination rs develop  
25 the by the center physicians who provide training  
26 in that speciality so in the case of lung disease they

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1  
2 would take the directers of major training programs  
3 in the United States allege obviously with a staff to  
4 help them and they would develop the questions that go  
5 into the examination they would balance out the  
6 questions to make sure that they cover all the  
7 important areas and obviously they define what the  
8 cerjt answers are though those questions.

9 That's the group that sets the examinations  
10 that you have to silt for.

11 Q Did you pass both you passed both fields your  
12 advances in both fields?

13 A .

14 Q In addition fl is also an oral  
15 examination verbal questioning was there?

16 A No used to be in the 3569.

17 Q You didn't have to go through that?

18 A Fortunately I'm young thuf we didn't have  
19 to go through the oral examination used to be an oral  
20 part particularly on the sbirjts medicine board  
21 where you could examine the patient in the morning  
22 print the patient to the ground of senior physicians  
23 and they would examine you questions that dpus felt  
24 that that was a fair and impartial uneven process  
25 because it dependses too much on the specific patients  
26 that you were assigned and so they felt that it was

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1  
2 better to go to just a written examination.

3 Q ?

4 A I have a ten denies si to speak fast  
5 apologize for that.

6 Q Does everybody pass the examination that  
7 takes it?

8 A No no they don't. As a matter of fact they a  
9 substantial fraction of the people who sit for the  
10 exam sometimes as much as 30 to 50 percent fail the  
11 examination.

12 Q Now after you completed that training did you  
13 go to work clinically somewhere?

14 A Actually the piece that is missing from this  
15 is that I spent two years if the public health service  
16 .

17 Q Talk it about about that?

18 A When I finished by internship a residency I  
19 went into the public health service the public health  
20 service is a nonuniformed branch of the service.

21 Q What do you mean nonuniform?

22 A Nonarmed branch of the uniformed service I'm  
23 sorry.

24 Q You don't carry guns?

25 A Do not Cary guns.

26 Q Go ahead

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1 ?

2 A They are the ground that are responsible for  
3 working to deem with the public health of the sons are  
4 United States investigate the he did deem mechanics  
5 dealing with chronic disease.

6 My task was working with the national  
7 clearinghouse to spork smoking and health I  
8 speblts would years in that process we did some sort  
9 of combined training process and service a lot of  
10 traifr that go is provided to you by the centers  
11 for disease control and my responsibilities  
12 at that time were to prepare the 1975 surgeon general's

report

13 and smoking and health for answer questions nationally  
14 on showinging answer health issues and to help develop  
15 surveys of smoking behavior in the United States I  
16 spent two years if Atlanta with the national  
17 clearinghouse for smoking and health then came to  
18 San Diego to take fellowship in chest medicine.

19 Q What is the national clearinghouse no smoking  
20 and health?

21 A Well national clearinghouse for smoking and  
22 health is a branch of the public health service. The  
23 public health as far as is that agency the federal  
24 government that is upon for public health.

25 It includes the food and drug administration  
26 thing includes national institute for hilt and

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1  
2 includes the centers for disease control mom ours the  
3 centers to disease control are tasks with the  
4 surveillance and control of disease in the  
5 United States that includes infix shus decision sizes  
6 including make lair I can't, take Burke loez imnone  
7 saying and variety of other infectious problems aids  
8 and they are responsibility to chronic diseases one  
9 the areas of chronic disease that they are responsible  
10 for is the chronic diseases related to smoking and  
11 their branch at that time was the national clears

12 house for smoiking and health.  
13 It was the part of the federal government  
14 that afrblgted as a repossess tore for all the  
15 information known at that time in the scientific  
16 literature on smoiking and health it walls  
17 responsible for integrating that information into  
18 documents to provide to the congress a defined what  
19 we knew and what the official position of the  
20 had you been lick health service sincere was on smoik and  
21 health it was responsible for conducting surveys to  
22 measure smoking in the United States and it was also  
23 responsible for designing and developing intervention  
24 that is might help people to quit or keep kids fl  
25 start to go smoke.

26 Q You understand because your our first witness

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1  
2 I'll take a lot of time in this area?  
3 A Okay.  
4 Q You used the word chronic what do you mean  
5 bay chronic kiss size Dr. Burns?  
6 A There are in medicine we separate things into  
7 2 categories. It if you wake unin the morning  
8 and your throat is sorry and you're coughing and have  
9 fever and you go to the doctor that's what we calm a  
10 cute disease it means that it happen the rapidly. 23  
11 if you develop chest pains running down producer arm  
12 you go to the hospital and you have a heart attack  
13 that is an acute event.  
14 There are a lost sub diseases however flit  
15 being one the best examples where the upon to problem  
16 that you have didn't come on quickly and most  
17 certainly doesn't go away quickly.  
18 So you have have a gradual onset of pain in  
19 your joints we manage to treat that and modify how  
20 symptomatic you maybe how much pain you have amount  
21 disease stays with you have you you have to learn to  
22 live with the disease process that then is a chronic  
23 prolonged or long-term disease in general in internal  
24 medicine we tend to deal more with chronic diseases  
25 high blood pressure, heart disease, kidney failure,  
26 crock object instruct tough lung disease, those are

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1  
2 diseases that are chronic or long-term disease process  
3 es.  
4 Q You mentioned the surgeon general's report  
5 we'll talk about a little later in the examination can  
6 we wait to do that?  
7 A Certainly.  
8 Q You spent most of your professional career  
9 involved in the area of tobacco smoking, health,  
10 correct?  
11 A Well for most of my career I've spent about  
12 half of my time in-patient care activitys and half of  
13 my time on public policy or public health issues a  
14 principal focus there being tobacco.  
15 Q Is the reason for your interest in the  
16 subject because of your starting out out with the

17 national clearinghouse no smoking and health?  
18 A Certainly that's part of the process by which  
19 I became knowledgeable and informed about it. As a  
20 physician so much of the disease that we see is days  
21 ed by caused by tobacco that it's hard not to be  
22 interested and concerned about this is a problem if  
23 you're care fog individual patients.

24 And so when I was looking and asking for  
25 advice from the chief residents at Boston city  
26 hospital I was trying to decide what I should do and

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1  
2 whether I should go into the public health as far as  
3 she encouraged me to take the position with the  
4 national clearinghouse because they felt it fit so  
5 well with my breast in lung disease and my interest in  
6 internal medicine.

7 Q I have the bibliography of words I've been  
8 reading and I see here that you were a clinical  
9 instructor and and that you have acted as a mover of  
10 method sin teaches rest did not as well, at practicing  
11 medicine tell us with that?

12 A As I described the process of internship and  
13 residency one the responsibility that is I have as a  
14 proffer of method sin is to help train medical student  
15 s internals residents and fellows in the  
16 practice of medicine.

17 Both in the intensive care units in terms of  
18 general medicine practice and also in terms of the  
19 specialty practice of chest medicine.

20 The way you learn in particular in the last  
21 two years of methodical school and during the time  
22 you're an internal resident and fellow is by assisting  
23 in the care of patient you have a team that team  
24 usually inclusives a fellow, one resident two or  
25 sometimes 34 internals and one or two medical students

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2 .  
3 They examine the patient they have to  
4 struggle with all the questions that examination  
5 raises come up with an answer as to what they think is  
6 wrong and offer a treatment plan.

7 We then go over that in great detail too  
8 teach them how to put the pieces together it's not  
9 enough to have book knowledge not enough to know a lot  
10 of facts you really have to be able to integrate  
11 that information together to that you get the right  
12 answer.

13 For example, in you have someone who comes in  
14 and you ask them do you have chest pains and they say  
15 well yeah I guess every once in a while I have chest  
16 pains we sort of all do certainly at my age. That's  
17 one response that is a yes. If on the other hand you  
18 say do you have chest main and they say I have this  
19 pain right here and goes down my left arm that a very  
20 different yes summons.

21 So you need to learn to be able to integrate  
22 that information need to be able to learn to listen to  
23 what you're being told by a patient.

24 To organize that in relation to what you see  
25 on physical examination, do some testing to corner  
26 firm what you see on physical examination and what you  
27 think might be going on, put all that information

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1  
2 together to make some diagnosis then design a plan  
3 to take care of that person.  
4 So that is a fairly time-consuming teaching  
5 process it has to be done in small numbers and it has  
6 to be done with individual staff, individual internals  
7 and residents and it involves individual parents so a  
8 lot of time and in my responsibilities as proffer of  
9 medicine was spent teaching people how to do this how  
10 to do this process it's a very satisfying kind of  
11 teaching because people you are working with are very  
12 interested in trying to learn what it is that you  
13 have to teach and it's also a very satisfying experience  
14 because you get to deal with and help real people,  
15 deal with their illness feel better about their  
16 illness and sometimes get better.

17 Q You do this at the university the California  
18 medical school in sand Diego?

19 A Yes.

20 Q I'd like to go through several positions with  
21 you just to identify them a scientific Editor of  
22 surgeon general's report to the United States  
23 department of health and human services I don't want to  
24 explain this process yet I want to know what the  
25 scientific editor is for the report?

26 A The surgeon general reports are reports that

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1  
2 we'll talk about later that view all of the evidence  
3 that is known scientifically about smoking and  
4 particularly smoking and health.

5 In order to do that you have to assemble  
6 all the the literature someone has to be responsible to  
7 making sure you have it all that it's or nice in the  
8 a way that coherent makes sense that the  
9 conclusions drawn are correct and that it actually  
10 comes together as a document that makes coherent sense  
11 that it doesn't say contradictory things that it  
12 presents a clear picture of the information.

13 That is the scientific editors point it's not  
14 really going through and proof reading the document  
15 too make sure that the grammar and spelling and  
16 proofing of the text is done that's a copy editor  
17 process but someone needs to be responsible to the  
18 scientific content and its accuracy that's the  
19 scientific editor.

20 Q Coordinator pulmonary clinical research and  
21 development laboratory at the University of California  
22 what is that?

23 A One of the responsibilities I have is to run  
24 the laboratory where we do special kinds of testing  
25 and do research evaluation of both equipment and  
26 testing in people

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1 .  
2           There are several types of test that go are  
3 done in a hospital one is the routine standard types  
4 of testing if you need to have your lung function  
5 tested you would go on the pulmonary function  
6 laboratory oftentimes particularly in a critical care  
7 environment there are special questions that we need  
8 to answer for special reason on an individual.  
9           We need to make measurements of a  
10 spefrb person pressure we need too do certain kinds  
11 of test all we need to evaluate knew and promising  
12 types of equipment that may give us new information  
13 the laboratory that I run S at US V is responsible to  
14 doing that doing the special testing delivering  
15 medicationes that is for example, night training  
16 oxide which is medication that opens up the  
17 blood vessels in the lung to improve blood flow through the  
18 lung that's not approved by the FDA has to be done in  
19 a very controlled whey not done in many patient the  
20 ve between to small dpraoun of people highly  
21 trained to be able to do that kind of flexible  
22 physiologic testing and customer mice the deliver I  
23 deliver of unusual forms of care to patients.  
24       Q       research advisory board institute for the  
25 study of smoking behavior policy John F Kennedy school  
26 of government, Harvard University

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1 ?  
2       A       That's correct.  
3       Q       That is not a long explaining what is that?  
4       A       It's the Kenny school formed is has is a  
5 school of government which examines a variety of  
6 different rent pools issues they had an institute  
7 that was examining the public policy of aspect of tobacco  
8 they were conducting research and doing various  
9 studies and ground of us acts an advice sorry board  
10 came in two times a year to review the refrnl they  
11 had done and make suction about research they might do  
12 .  
13       Q       What is this policy advice sorry committee no  
14 community intervention to trial to smoke cessation  
15 National Cancer Institute?  
16       A       The National Cancer Institute initiated and  
17 conducted what remains a very large trial the largest  
18 trial that has been done on a behaviorial outcome.  
19 That trial was a swerp vengs that looked at  
20 community and actually one the community was here  
21 in the State of Washington.  
22       Q       You say trial I think of what we're doing  
23 here what do you mean by trial?  
24       A       I apologize I realize that that probably have  
25 different connotations in this environment.  
26       Is trial take test where what was done was a

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1  
2 selected 11 mun its where they would make a  
3 concerted effort to work with those community to help

4 change smoking behavior they also selected 11  
5 communities vary close this proximity it would be a  
6 controlled community where they wouldn't make the  
7 intervention the trial then is a test to see whether  
8 the community where you made the intervention was more  
9 successful at controlling smoking behavior than the  
10 community where you did not make an intervention it is  
11 very common in medicine to refer to this type of  
12 testing as a trial one that most people are familiar  
13 with as you give someone a a drug and see where they  
14 get better you give another group of member a placebo  
15 sugar pill and see whether the rate at which the  
16 people who got the real drug get enter higher than the  
17 rate at which people get better with a placebo  
18 so that is a way of testing scientifically to see  
19 whether a drug works and whether one intervention or  
20 one medication is better than another.

21 Q I'm sorry?

22 A I was going to say that the trial was a very  
23 large I believe it was about hundred million dollars  
24 when it was finally done and with that amount of money  
25 the cancer institute asked a group of experts advice  
26 experts themselves included to monitor the decisions

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1  
2 being made about conduct of the trial as the trial  
3 goes on they have to make decisions what to do  
4 and not to do and we were responsible for monitoring  
5 that process on the policy advice board.

6 Q And you were a consultant to the  
7 United States product safety commission on fire safe  
8 cigarettes?

9 A Yes.

10 Q What was that?

11 A Well one of the consequences actually of  
12 cigarette smoking that we don't see very commonly  
13 in the newspaper as a health consequence are the  
14 naos that are created by cigarettes.

15 If you leave a cigarette burning on a couch  
16 it can cause a fire. And one the thing that is  
17 congress has asked the consumer product safety  
18 commission to do is look into the question of whether  
19 it would be possible to make cigarettes that didn't  
20 cause a fire.

21 The cigarettes themselves distinguish  
22 themselves after three or four minutes they wouldn't  
23 small smoulder long enough to actually cause a  
24 couch to burst into flame I was asked to participate  
25 in that effort and to draft a chapter that looked  
26 at how you would evaluate of the question of folks

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1  
2 is it of these newer grills in come pairs to the  
3 known toxicity of the existing product.

4 Q Dr. you were a committee member the  
5 surveillance implementation group the national cancer  
6 institute what did that self?

7 A Recently this is something that is currently  
8 underway the national cancer institution has conducted a

9 review of all of its activity that they are trying to  
10 do a what most organizations do period issuely which  
11 it to examine how they are doing things and what  
12 they are doing see whether they should change direction

one

13 the areas that they are examining is the question of  
14 what kinds of things they do surveillance on.

15 Surveillance is the repetitive measurement of  
16 disease rate or a behavior or an incidents of illness  
17 steadily overtime.

18 For example, you all have seen I think  
19 reported in the newspapers death rates in the  
20 United States changes in death rates in the United States,  
21 that is a form of surveillance we look at whether the  
22 date rate from a given disease is change also as time  
23 goes forward between I got changing we look for the  
24 reasons why it might be changing. If it's improving  
25 then we can use that as a measure of the success and  
26 to certain, extends it's the ultimate measure of our

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1  
2 success at intervene to go prevent that disease.  
3 Q You served 9 America Kang lung association  
4 life and breath award for distinguished community  
5 service what was that award and why did you receive  
6 that?

7 A Well the American lung association is the  
8 national volunteer ri health agency that is  
9 interested or has defined as its mission lung disease.  
10 I worked through the years obviously as an excess  
11 fusion very closely with the lung association and in  
12 sand yaiging go in particular we looked very  
13 closely to help the lung association and the city of  
14 San Diego develop and implement regulation that is re  
15 strict the locations where member can smoke in order  
16 to protect nonsmokers from exposure to sex hand  
17 cigarette smoke.

18 Q You also received the surgeon general's  
19 medical union?

20 A Yes.

21 Q Telephone us about that?

22 A I was quite proud to have receive that had  
23 there is less than 20 people who receive that award  
24 it is an award by given by surgeon general C Everett coop  
25 for the work that I've done on the national level for  
26 develop and explain and present the information on the

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1  
2 health consequences of smoking and particularly the  
3 work that I've done with surgeon general's report on  
4 smoking and health.

5 Q I'll swish subjects talk about publications  
6 for a minute?

7 A Okay.

8 Q You have public lirbed the health  
9 consequences of smoking.

10 Was that a report that?

11 A Yes.

12 Q And that was in 1975?

13           A       Actually the first publication that I have on  
14 my CV the first thing I wrote was the 1975  
15 surgeon general's report I was a health officer medical  
16 officer with the national clearinghouse at that time  
17 and it was my responsibility to review all of the  
18 evidence that had been accumulated in the last year  
19 and to organize and present that evidence in a report.

20           That was the 1975 report of the a l  
21 surgeon general on smoking and health.

22           Q       Hold on a second do we have those.

23

24                   (At this time an off-the-record discussion  
25 was held.).

26 BY MR. LUVERA:

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1  
2           Q       I'll get those reported so we can talk about  
3 them more you also published the health consequences  
4 of smaoek fog women?  
5           A       There are a series of surgeon general's  
6 reports that I have have been very deeply involved in  
7 both at author on editor they include 1979  
8 surgeon general arrests report was a 1500 place beige page  
9 review of everything that was known at that time, 1980  
10 surgeon general's report which focused on the  
11 consequences of smoke fog women, 1981 surgeon general  
12 's record which looked at the changing  
13 cigarettes low tr and nicotine cigarettes what  
14 information did we have on whether they changed risks  
15 in 1982 we focused on cancer and it is a detailed  
16 examination of everything that was anyone at that time  
17 about the relationship between smoking and cancer in  
18 1983 we did the same thing with heart and vascular  
19 disease in 1984 we looked at lunch disease in 1985 we  
20 examined the relationship of smoik and those  
21 disease that occur in the workplace particularly  
22 cancers that occur in the workplace and chronic lung  
23 disease that occur in the workplace.

24           In 1986 we examined the data on second hand  
25 smoke exposure and subsequently I have been a reviewer  
26 for reports that have examined the question on

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1  
2 addiction and the question of the benefits of  
3 cessation when you sop smoking what happens to your  
4 risks after you smoke of stop smoiking there have  
5 also been reports on smoking of America comes that  
6 I've been a review are to smoking in youth and more  
7 recently smoking on minoritys on understand I was  
8 snr reviewer on all of those reports.

9           Q       Those report the ro surgeon general reports  
10 ?

11           A       That's correct.

12           Q       You were a participant in those reports?

13           A       Yes.

14           Q       You want of the reports dealt with the 1981  
15 surgeon general report dealt the health consequences  
16 of smoking, the changing cigarette?

17           A       That's correct.

18 Q You participated in that?  
19 A Correct it was an effort to look at the tech  
20 logic changes in the engineering the cigarette product  
21 and whether those changes would reduce the disease  
22 consequences of using the product.  
23 Q In 19834 the subject was the health  
24 consequences of smoking cardiovascular disease,  
25 correct?  
26 A Yes

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1 .  
2 Q In 1984 the health consequences of smoking  
3 chronic obstructive lung disease?  
4 A That's correct.  
5 Q Now come toss a look I know something about  
6 you also contributed to a book known as cease sill  
7 that is textbook of medicine?  
8 A Yes.  
9 Q In the United States there are two classic  
10 books on internal medicine hairs sons and see sill's?  
11 A That's correct.  
12 Q You contributed to this how many times  
13 with you distribute to this book?  
14 A Twice I awe thaored chapters on tobacco in  
15 cease sill.  
16 Q Now what there is a reference to W D Saunders  
17 publication in 1981 sgrelts and cigarette smoking  
18 fell us about that?  
19 A Sawn ders proper dueses a series on chest  
20 disease which are thin books that deal with individual  
21 top mechanics I authored a dhapt ter there  
22 and cigarette smoking and change this is smoking  
23 behavior.  
24 Q In 1991 you apparently published with another  
25 person or other Americans in the journal of the  
26 American Medical Association on the subject of does

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1  
2 tobacco advertising target young people to start  
3 smokinging?  
4 A Is that correct I was one the part pablts  
5 in which study Dr. peers was 9 lead author on that  
6 subject.  
7 Q 1992 study tobacco uses in California 1991990  
8 to 1991 tell us what that involved, please?  
9 A The State of California as many of you know  
10 passed a proposition that increased tack tax on  
11 cigarettes a devoted a small portion of that tax to  
12 implementing a program to help people quit and to keep  
13 kids from starting.  
14 As part of that process they needed to  
15 evaluate whether they were being successful and so  
16 they let a contract on the University of California  
17 which I was one of the principal vet gait I respect to  
18 do a survey to look at what smoking behavior was, why  
19 people were smoking, how much people were quitting  
20 and we generated a report to evaluate the effectiveness of  
21 program at that point in time.  
22 Q There is a publication fl 94

23 epidemiology of lung cancer things lungly olg and  
24 health and dizzy and we have used with the jury  
25 already this word epidemiology.  
26 Could you translate for us what epidemiology

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1  
2 is?  
3 A Sure. Epidemiology tends to unfortunately  
4 get to heavily focused on complex statistics.  
5 But the truth is what epidemiology simply  
6 observations of groups of people.  
7 There are two ways you to observe them you  
8 ask observe them looking backwards in time  
9 for example, you could take all the people who have lung  
10 cancer and see whether they smoked more than a group  
11 of people who don't.  
12 Another way to do epidemiology is to take a  
13 large group of people that don't have anything wrong  
14 with them that you know of and then follow thumb  
15 forward in time. And see what happens to individuals  
16 who have different characteristics see whether the  
17 smokers get more disease than the nonsmokers in that  
18 population.  
19 Epidemiology is nothing more manner a word  
20 that describes observations of human populations over  
21 periods of too time in order to try conclusions about  
22 what causes illness or disease or other problems in  
23 those populations.  
24 Q I counted 92 publications, books,  
25 publications and mere review articles and so on we  
26 only covered a new of of them I age ill correct there

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1  
2 are 92?  
3 A I would and semi you're count.  
4 Q I wanted to ask something else Dr. Burns  
5 are you here to advocate banning smoking and the seam of  
6 tobacco in the State of Washington?  
7 A No and I have a long-standing physical  
8 position as do smos of member in the public health  
9 community that that would be inappropriate.  
10 My goal is to eliminate the disease  
11 consequence as a physician I sit at the bedside of  
12 people and have to tell them that they have lung  
13 cancer have to tell them and their family that is  
14 they are going to die of it that is not to process that  
15 anybody wants to have happen and when it happens  
16 because of something that is preventable it's  
17 particularly tragic therefore my goal is to eliminate  
18 that burden of disease as we go forward in time. That  
19 will probably mean that we're going to have to  
20 encourage those people who are trying to qit  
21 to be successful and we're going to have to find ways to  
22 keep kids who are starting to smoke from starting to  
23 smoke.  
24 Q ?  
25 A But my goal is not to ban smoking my goal is  
26 to get rid of the disease and I have a firm position

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1  
2 that I think it would be wrong and counterproductive  
3 for that matter for the state or for the federal  
4 government to ban the manufacturer or sale of  
5 cigarettes.  
6 Q Now I'm going to move to the reason I brought  
7 you here, the subject, so that we understand how you  
8 formed the opinions that you are going to express  
9 could you tell us start with one how many years  
10 have you been in medicine start with that?  
11 A Well I guess it depends on when you start I  
12 sort of been in medicine since 1968 when I start  
13 ed medical school but actively taking care of  
14 patients since 1970 when I began as medical student to  
15 work within the hospital environment and been  
16 responsible to the care of patients directly since my  
17 southwestern ship and been independently responsible  
18 directly for the care of patients as a mental are  
19 member of the faculty and as a physician on the staff  
20 of the University of California signed yaig go  
21 medical center since 1979 I've been involved in  
22 studying issues and tobacco since 1974.  
23 And have been continuing in reading studying  
24 examination of a wide range of sources of information  
25 some of them the traditional scientific literature,  
26 some of them descriptions historically of high tobacco

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1  
2 developed a lot of them related to tobacco behavior  
3 and more recently documents that have become available  
4 from the tobacco industry itself that define the  
5 knowledge that they had and what they were thinking  
6 about during this same period of time.  
7 Q You have participated in how many  
8 surgeon general reports?  
9 A I have been an author editor or center re  
10 viewerer every sr's report since 1975 that's 15  
11 or 16 of thifm I would lose count.  
12 Q Have you reviewed documents that have become  
13 available in the last few years from the sberbl  
14 documents of the tobacco companys?  
15 A Yes I reviewed a wealth of documents fixly  
16 documents that relate to the technical knowledge that  
17 they had the types of evaluations they were doing on  
18 different types of cigarettes, what kinds of testing  
19 they were doing of those cigarettes as well as their  
20 strategy and thinking on the development of the  
21 tobacco products.  
22 Q So do you feel that you are in a position to  
23 talk about this subject knowingly and with some  
24 authority?  
25 A Yes.  
26 Q Throughout my examination of you when I ask

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1  
2 you about your opinion I want you to know that the law  
3 says that you're your opinion has to be based upon

4 reasonable medical certainty if it deals with a  
5 medical reasonable reasonable probably if it deals  
6 with any other opinion?  
7 A Yes.  
8 Q I'm going?  
9 Q I'm not going to use that phrase also but if  
10 you cannot say it with reasonable probably point that  
11 out to me?  
12 A I will make every effort to to do that.  
13 Q First exhibits we need to talk about is  
14 demonstrative Exhibit 2 hundred which I'd like called  
15 to the screen of everybody but the jury so I can lay a  
16 foundation.  
17 I think it will show up on your screen if  
18 things are work woulding working.  
19  
20 A I have it on my screen I already know it and  
21 maybe we could show it to the jury.  
22 Q No I've got to qualify this I believe the  
23 procedure is I hand it up to Your Honor.  
24 Thank you?  
25 Q Now what is this document?  
26 A

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1 .  
2 Q The jury hasn't seen it yet but what is what  
3 does this document represent?  
4 A This document presents the data fl the  
5 US department of the agricultural on the use of  
6 tobacco products in different forms, chewing tobacco,  
7 cigars and cigarettes for example,, from 1880 through  
8 almost the current date, probably goes this one goes  
9 up to 1995.  
10 Q So a represents consumption of various types  
11 of tobacco products during that period of time?  
12 A Rents how tobacco products were used, tobacco  
13 is a plant obviously and it can be used in a variety  
14 of different ways be to be even yes, sired by memo  
15 this describes the change in the way tobacco was used  
16 overtime.  
17 Q And from the standpoint of reliability this.  
18 Information comes from what sorls?  
19 A Comes from the United States department of  
20 agricultural they are the ones who track  
21 this information from the federal government.  
22 Q Is this a reasonably reliable source of  
23 information that a person such as yourself and expert  
24 fields would rely upon?  
25 A This is is the source that we use for  
26 this information and it is felt to be both relate able and

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1  
2 consistently acre lated overtime.  
3 MR. LUVERA: The State offers exhibit  
4 demonstrative exhibits 200 America mechanic objection.  
5 THE COURT: Overruled.  
6 MR. McCORMICK: The court's order addressed  
7 this document.  
8 THE COURT: No, I reserved ruling based on

9 the showing made in court as to this and other  
10 demonstrative.  
11 MR. McCORMICK: Could I add then that with  
12 that Your Honor we would ask that the document be  
13 admitted no demob extra active purposes.  
14 THE COURT: It is.  
15 MR. LUVERA: Excuse me Your Honor I'm offer  
16 ing this as an exhibit based upon reliability  
17 data and not for illustrative purposes I'm offers as  
18 substantive exhibit having laid the foundation I did  
19 I'm now so Your Honor United States making the  
20 distinction between what goes another jury and what  
21 doesn't I'm saying this a substantive document I've  
22 laid the foundation for not just a semi mat particular  
23 drawing.  
24 THE COURT: The document is admitted we'll  
25 discuss the extent of that admission later.  
26 MR. LUVERA: Thank you could the jury

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1 .  
2 Q Could you tell us what we we're seeing here  
3 please what does this represent?  
4 A I'll give you background first. Most of you  
5 remember back in Graham her school hearing about  
6 tobacco it was a major part the United States. The  
7 American Indians and the Indians in South America,  
8 Central America used tobacco and introduced that to  
9 Columbus and the Columbus sailors when they first  
10 referred in the new world. It walls brought back  
11 to the European don't nenlt about Columbus and  
12 became one of the principal sources of revenue for the  
13 newly developing United States.  
14 Tobacco was a cash crop for many of the  
15 states Maryland, Virginia, et cetera.  
16 When they were colonys unBritain and allude  
17 the United States to generate substantial revenue  
18 in its's early years as a country.  
19 But the form of tobacco that was used  
20 at that time was different as smafrbt prior to 1900 as you  
21 can see on this graphics the pink see if I can make  
22 this work.  
23 The pink which you see here cigarette use,  
24 was very very low and the bulk of tobacco that was  
25 consumed was consumed as snuff, chewing tobacco, pipe  
26 or role your own types of cigarettes, cigars and only

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1  
2 a tiny amount was consumed cigarettes.  
3 There were a number of changes that led to  
4 the rapid rise in cigarettes that you see beginning  
5 about 19134.  
6 The, 13 the first of which was they dove l  
7 invent the and purchased the machine that could  
8 manufacture cigarettes.  
9 Anyone who has tried too role their own  
10 cigarettes knows it not to easy task and muf more  
11 convenient to use cigarettes in if you can have them  
12 in a manufactured form.  
13 So these are really an engineering change

14 in the delivery of tobacco to the public.  
15 Second change that we don't often think about  
16 actually is one which was the even vengs of safety  
17 matchs.  
18 Q Invention of what?  
19 A Invention of safety matchs.  
20 Q Safety may haves?  
21 A That's right prior to the even vings of  
22 safety match the matchs 23 you keep them together in  
23 our pocket could stain contain yously ignite  
24 that was a strong diseven sent toif carrying them around  
25 therefore in order to be use gaks as a small  
26 convenient manufactured rod you have to have a

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1  
2 mechanism 1 lighting it unless you were able to  
3 carry matchs around it was difficult to use.  
4 Then in 1913 R.J. Reynolds untook a national  
5 marking cap page national media campaign to promote  
6 Camel cigarettes, the sale of Camel 1 cigarettes  
7 took off and most of the other cigarette manufacturers  
8 followed suit with national marking campaigns and the  
9 cigarette became as you can see the predominant form  
10 of tobacco use in the United States.  
11 Q Now I'm old enough to remember a machine that  
12 was sold that involved rolling make your own cigarette  
13 s with a machine that rolled you put the  
14 tobacco in and role it up for you for those who  
15 weren't good enough to do it yourself you're not  
16 uking talk wg that you're talk wg a  
17 different machine?  
18 A No talking about a large machine that can  
19 manufacture thousand or hundreds of thousands units of  
20 cigarettes over nine night periods of time they did  
21 pit them out in very large volume rather than one or  
22 two at a time.  
23 Q See this period here I guess it's right  
24 around the 1950s?  
25 A If we move to another graphic it might be  
26 easier to draw those distinctions I think

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1 .  
2 Q Don't make me move to another graphic I'll  
3 not be able to do it this high peek of opinions there  
4 we see in about 1950s does that represent a peek of  
5 cigarette smoking or cigarette consumption it that  
6 what we're seeing?  
7 A It represents one description of the peek of  
8 cigarettes. This nod to compare cigarettes with  
9 chewing tobacco you have to some have some mechanism  
10 by which you compare so this graph shows the pounds of  
11 tobacco used per person over the age of 18 per year  
12 that's not the same thing as the number of cigarettes  
13 used, it's the pounds but that's one way of come  
14 marriage how tobacco was ut liesed by the public.  
15 Q Now?  
16 (At this time an off-the-reco discussion  
17 was held.).  
18 Q ?

19 BY MR. LUVERA:  
20 Q Let me hand to you demonstrative Exhibit 201.  
21 Got that?  
22 A Yes.  
23 Q Can you tell us please what this illustrates?  
24 A This is a dwraf that illustrates  
25 per capita consumption of the cigarettes that is it looks  
26 directly at cigarettes as number take the number of

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1  
2 cigarettes manufactured in the United States and you  
3 divide it by the population the United States over the  
4 age of 18. So if becomes a measure of if you will the  
5 average use of cigarettes in the US population.  
6 It is then portrayed for each year from 1900  
7 through I guess about 1995 again data once more comes  
8 from the US department of agricultural and it  
9 describes the use or the number of cigarettes that  
10 people use as an opposed to the graph you have up on  
11 the screen which shows the pounds of tobacco used per  
12 person.  
13 Q And is this reasonably accurate?  
14 A Yes.  
15 Q Based upon reliable data?  
16 A Yes.  
17 Q Does it correctly represent the events as you  
18 under them that are depicted on this chart?  
19 A Did does.  
20 Q We offer Exhibit 202 mik mechanic 201  
21 I believe we have no objection to the for demonstrative  
22 purposes?  
23 THE COURT: Admitted.  
24 BY MR. LUVERA:  
25 Q Off record off record?  
26 BY MR. LUVERA:

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1  
2 Q Your Honor I'll show you this is a?  
3 A lairn ldz poster of what yes woe just  
4 talked about.  
5 THE COURT: Fine.  
6 BY MR. LUVERA:  
7 Q Dr. Burns can I get you to step to the chart?  
8 A Sure.  
9 Q Which is for the record Exhibit 201 I'd like  
10 you to explain on the jurors what this chart  
11 represents, please?  
12 A .  
13 Q Okay go ahead Dr.?  
14 A This is a graph that shows the history  
15 overtime of the use of cigarettes in the United States  
16 .  
17 You can see from the previous graph and from  
18 that that cigarettes as opposed to tobacco has been  
19 with us for three or four hundred years as oppose the  
20 to tobacco sgrelts are really a 20th century  
21 device.  
22 They are not the same form of tobacco that  
23 has been used for several hundred years they are a

24 product that was engineered, developed and marketed to  
25 create an enormous use within this century.

26 So let's go through this process. It started

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1

2 in 1900 when per capita consumption was about 54 as  
3 measured, very few cigarettes were used.

4 It peaked here in 1963 at about 4,000,300  
5 cigarettes on average for every person in the  
6 United States over the age of 18.

7 But you can see that this curve is not smooth  
8 .

9 There are a lot of ups and downs on this  
10 curve afternooon they relate to specific thing that is  
11 were going on at that time.

12 And it's very useful to examine them.

13 The first is this small up take you see in  
14 1891-1913. That's when cigarettes were first mass market  
15 ed the Camel cigarette was marketed extensively  
16 with the national marketing campaign demonstrate  
17 that had people would begin to use it based on that  
18 marketing campaign and other cigarette manufacturers  
19 began to use the same marketing.

20 MR. McCORMICK: Objection to the narrative  
21 here we're not going to have an opportunity.

22 THE COURT: Sustained.

23 BY MR. LUVERA:

24 Q I guess I've asked the doctor to explain the  
25 that is right what has which has a number of entries  
26 on it perhaps go year by year and explain what

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1

2 those represent?

3 A Okay the next major change we see here occurs  
4 around the time of first world war.

5 Large numbers of the males at that time were  
6 mobilized into the military from an agricultural  
7 country that was the United States and one of the  
8 things that happened while they were in the military  
9 was that they learned how to smoke cigarettes, it was  
10 a convenient form of tobacco use and general per  
11 shipping actually asked the Congress to purchase  
12 cigarettes for use by the soldiers.

13 Cigarette consumption climbed steadily  
14 through the 1920s and 30s and then in 19  
15 29 there was a substantial down turn. That was the  
16 period of the great depression, that was the period  
17 inform, in which enormous numbers of people  
18 within the United States were without work and where  
19 there was not much income available for many people to  
20 spend on any kind of item.

21 One of the things that happened during that  
22 period was a modest but very real decline in the use  
23 of cigarettes.

24 That reversed and then we see a tremendous  
25 jump during the period 1940 to 1945. Once again that  
26 was the second world war with large numbers of males

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1  
2 mobile lied in the military and tobacco companies  
3 gave away free packages of cigarettes to soldiers,  
4 gets were available if the last shuns of soldiers  
5 and large numbers of males took up smoking.  
6       Something else happened at that time as well,  
7 though.

8       Women for the first time were mobile lied  
9 from the home into the work force. The tobacco  
10 companies began marketing cigarettes.

11       MR. McCORMICK: I'm sorry I object this is  
12 not to question and answer it's a lecture.

13       MR. LUVERA: The problem is Your Honor I can  
14 say what happened in 1930.

15       THE COURT: He can give the historical  
16 narrative limited to the information contained in the  
17 chart.

18       MR. McCORMICK: We would object to the  
19 references for instance, to what he tends to know  
20 about cigarettes market the for instance, it's not  
21 been closed disclosed no qualification on that.

22       THE COURT: Overruled at this point it's a  
23 short narrative it's acceptable.

24       THE WITNESS: Cigarette companies began to  
25 market cigarettes to women in the 1930s but with the  
26 physical and social awe ton my that came with having a

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1  
2 job many women began to take up smoking in the 1940's.  
3       And per capita consumption went way up, climb  
4 ed again, again went up during the Korean war  
5 when again large number of people were mobile  
6 laoilised then in 1953 and subsequently we saw a  
7 substantial down turn.

8       In 1952 and 1953 for a certain exsnt before  
9 that scientific community began to publish the first  
10 solid scientific information that clearly demonstrated  
11 that cigarette smoking caused disease.

12       Perhaps more importantly for this curve  
13 that information was picked up published and disseminate  
14 the by Reader's Digest by consumer reports and by a  
15 number of lay press outlets.

16       Q       What is the time permd?

17       A       This is from 1953 through about 1957 or 8.

18       Q       For the record Dr. Burns is this information  
19 you're sharing with us from reliable data research  
20 data that you are familiar with?

21       A       Yes.

22       Q       The sort of thing that expert the such as  
23 yourself would rely upon?

24       A       That's correct.

25       Q       Go ahead.

26       A       We then see that turn around. What happened

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1  
2 during that turn around was the tobacco industry began  
3 to confuse the public about what the scientific  
4 community.

5 MR. McCORMICK: Objection.

6 THE COURT: Sustained.

7 BY MR. LUVERA:

8 Q Dr. Burns go ahead I'll come back to that.

9 A Cigarette consumption went back up. In 1963  
10 it peaked on January 11, 1964 surgeon general again  
11 released or not first time released a report that  
12 defined in great scientific detail all of our  
13 understanding of smoking and disease and made a clear  
14 statement that cigarette smoking caused lung cancer in  
15 males.

16 And you can see that that information again  
17 produced a down turn.

18 An addition all down turn occurred 1967  
19 through '70. At that time under the fairness dock  
20 train doctrine advertising on television had to be  
21 balanced by spots that were anti-smoking spots on  
22 television and at its peek for every for ads for  
23 cigarettes there was one anti-smoking spot.

24 When we examined the data during that time we  
25 see that not only did per capita consumption decline  
26 but there was a substantial increase in cessation

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1  
2 in the population and that is felt by the scientific  
3 community to be directly related to the conduct of  
4 this national media campaign on television.

5 1970 cigarette advertising was banned from  
6 television and with it went all the anti-smoking spots  
7 . So this campaign that had been conducted now  
8 disappeared.

9 Per capita consumption again began to climb.

10 Beginning in the mid 1970s people began to  
11 object to being exposed to other people's cigarette  
12 smoke. And cigarette smoke smoking went from a  
13 process that take sill state the enter, that with  
14 others that enabled people to communicate that helped  
15 people socialize to one where smoke began to be  
16 perceived at socially unacceptable.

17 Q Stop you a second.

18 In fact can you tell us whether or not much  
19 of what you're tefrling us here has been covered in  
20 surgeon general reports over many years that you  
21 have been involved?

22 A Yes.

23 Q And these facts we is fine in the  
24 surgeon general reports an if we go back as you ask and go  
25 through them?

26 A In a surgeon general reports and other

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1  
2 tlit tur.

3 Q Tell us whether or not the surgeon general  
4 reports are considered reliable data by the scientific  
5 communication it?

6 A Yes they are documents extensively reviewed  
7 they are the official pngs of the US

8 Public Health Service on the sign answer and are extensively

relied

9 on as the document that's define these issues by the  
10 scientific community.

11 Q Go ahead Dr.?

12 A Would Your Honor have any problem with  
13 somebody giving the jury a bottle of water because  
14 they are cough.

15 THE COURT: The clerk could do that fully.

16 BY MR. LUVERA:

17 Q Go ahead Dr. Burns?

18 A You could see that from that period forward  
19 there was a fairly steady decline in per capita  
20 consumption. That is felt to be due to two effects,  
21 one is that making cigarette smoking less socially  
22 acceptable takes away some of the personal social  
23 logic and psych logic rewards for the smoker.

24 And secondly, as you limit where people can  
25 smoke, we find that those people who try to quit are  
26 more likely to be successful that's particularly true

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1

2 in you eliminate smoking at work.

3 And that perhaps is indispute actively  
4 obvious but what it means is someone who is trying to  
5 quit makes the effort to quit they can't smoke at work  
6 it means they can't relapse or go back to smoking  
7 while they were at work so if help the them stay off  
8 gets.

9 That is has continued somewhat accelerated by  
10 an increase in the carette tax in 1982.

11 One the thing that is we know most clearly is  
12 that if you raise the please of cigarettes through  
13 taxation in particular you're able to substantially  
14 change the use of cigarettes driving consumption then  
15 and presumably increasing the number of people who are  
16 trying to quit and the number of member who quit  
17 successfully.

18 So you can see that tobacco has wrist Sentra  
19 mat particular Californially during the 20th sent  
20 industry from a product of tobacco use that was  
21 essentially an odd it at the start of century on the  
22 dominant form of the tobacco use that it is currently  
23 taken that there have been substantial declines and  
24 substantial increases in that relate to events that  
25 have occurred in our own history.

26 Q Thank you retake the chair

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1

2 All right I want to go next to the 1953  
3 meeting of the executives on the tobacco various  
4 tobacco companies.

5 And discuss that meeting with the jury  
6 and then I want to talk about the Frank Statement. So  
7 would you lay a foundation based upon your review  
8 of the documents and your understanding of the materials  
9 given what -- I'm not going to go through the commits  
10 what occur in 1953?

11 A In the period between 1950 and 1953 a  
12 substantial number of credible scientific studies were  
13 published that looked at cigarette smokers or actually

14 looked at patients with lung cancer and saw that  
15 pirbts with lung cancer were much more likely to be  
16 cigarette smokers and more likely to be heavy  
17 cigarette smokers than patient the slebted as a  
18 control group.  
19 In addition in 1953 a study was published  
20 that when they take tobacco smoke and condense is  
21 remove the nicotine and water from that condeny state  
22 and paint it on the back of a mouse that those mice  
23 develop tumors so the combination of demonstrating the  
24 relationship with lung cancers in humans and the  
25 demonstration of the capability of tobacco smoke to  
26 cause cancer in animals led to the scientific

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1  
2 community reaching a conclusion that cigarettes were  
3 likely to be a hazard that became very much in the  
4 public braoad ant tobacco companies were very  
5 concerned their values of their stocks were following  
6 falling and the sales of cigarettes were beginning to  
7 fall.  
8 Q I'll stop you there a second.  
9 One of the study that came ought and cancer  
10 came did it not from the shown ketering news?  
11 A Yes.  
12 Q The name is could be important what was the  
13 name of the doctors do you recall who were involved  
14 in that study?  
15 A There were two physicians, Dr.s Graham and  
16 Dr. Wynder.  
17 Q Wind speaker?  
18 A .  
19 Q Spell that?  
20 A W Y ND ER and they conducted the study  
21 difficult and Dr. Wynder in particular who was the  
22 younger member of that team has public lirbed an  
23 enormous amount of information on tobacco over the  
24 next 30 to 40 years but they took the condensate  
25 painted it on the backs of animals, the animalises  
26 developed tumors and therefore, and that was a

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1  
2 relatively clear way of evaluating whether the  
3 substance had the capacity, had the ability to cause a  
4 cancer.  
5 Q Now based upon your review the internal memos  
6 and documents you have seen, do you have an opinion as  
7 to an essentially what happened at the meeting of the  
8 tobacco expect it was on December 15, Tuesday, in the  
9 year 1953?  
10 MR. McCORMICK: Objection.  
11 THE COURT: Sustained.  
12 BY MR. LUVERA:  
13 Q You seen documents which tell us what went on  
14 at that meeting?  
15 A Yes.  
16 Q Following the meeting you are aware of the  
17 Frank Statement being published across the  
18 United States?

19 A Yes.  
20 Q Showing you Exhibit 25.  
21 Can you tell us what this is?  
22 A This is what is referred to as the  
23 Frank Statement because it was an advertise meant placed  
24 widely throughout the United States that was by the  
25 tobacco industry to cigarette smokers about their  
26 intent relative to the developing information that

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1  
2 cigarettes caused cancer.  
3 Q I'm going to come back to this but in summary  
4 by way of brief summary what was the import of this  
5 Frank Statement that was published?  
6 A As I understand from our review of the  
7 documents the import of this statement was that the  
8 tobacco industry recognized that mt people were  
9 becoming very concerned about their smoking behavior  
10 and about the link between that smoking behavior and  
11 causing cancer and that this was an effort to reassure  
12 those smokers presumably so they would not stop  
13 smoking.  
14 Q Now are you familiar from reading the  
15 documents you have been provided with the  
16 Tobacco Industry Research Committee and its formation

things

17 yes?  
18 Q Are you also familiar with the organization  
19 that were created after that including the  
20 Tobacco Institute so on are you familiar with these  
21 organizations?  
22 A Yes.  
23 Q Would you please tell us what the sequential  
24 development of these organizations were first explain  
25 from reading the material that you reviewed what they  
26 purport to be that is what was their function

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1 ?  
2 A The Tobacco Industry Research Committee  
3 what was which was formed shortly after ter this  
4 Frank Statement was a committee that had a dual function,  
5 one was a public relations function and one was a  
6 vehicle by which research could be funded from monies  
7 obtained from individual tobacco companies.  
8 Subsequently those functions were somewhat  
9 split in that the public relations functions were  
10 transferred to the Tobacco Institute.  
11 I believe in about 1958 or so and a separate  
12 committee to focus on the to be a vehicle by which  
13 monies could be spent and given to individual  
14 researchers was created that was the  
15 Tobacco Research Council.  
16 Q Tobacco?  
17 A Research counsel.  
18 Q Counsel?  
19 A Counsel.  
20 Q ?  
21 A Both of those structures were organized  
22 developed and supported obviously by the individual

23 tobacco companies.

24

25 Q Now the first one was formed just after the  
26 meeting at the Plaza Hotel and about the time of the

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1

2 Frank Statement?

3 A That's correct it was formed right after that  
4 meeting and it was intended to have both a public  
5 relation function.

6 MR. McCORMICK: Objection to the ashum  
7 sthun.

8 THE COURT: Sustained.

9 BY MR. LUVERA:

10 Q I'll lay a foundation.

11 You read the materials and documents internal  
12 materials and documents of the tobacco industry  
13 relative to why these organizations were formed  
14 have you not?

15 A Yes.

16 Q And have you studied these documents so you  
17 know what they the tobacco companies say about this  
18 particular organizations?

19 A Yes.

20 Q Why is this that the first one was formed  
21 then?

22 MR. McCORMICK: Objection.

23 THE COURT: Sustained.

24 BY MR. LUVERA:

25 Q I'm confused my belief that?

26 THE COURT: No don't need to, move on we'll

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1

2 discuss this at the recess if you wish not trying to  
3 take you off the subject but love live I can come back  
4 I understand.

5 Q I forget to cover one think with you, that is  
6 filter cigarettes.

7 When did filter cigarette come on the market  
8 I'm come back on the subject but time-wise  
9 historically?

10 A Filters were first placed on cigarettes  
11 in the 1940's but very few mefmt smoked filter  
12 cigarettes until mid as 50s when the tobacco companies  
13 grand to mark manufacture and market filtered products  
14 very heavily then that there was a rapid rise that has  
15 continued until currently about 97 percent or so of  
16 all of the cigarettes consumed in the United States  
17 are filtered cigarettes.

18 Q Dr. Burns, based upon reasonable medical  
19 certainty do you have an opinion as for whether or not  
20 smoking causes disease?

21 A Absolutely there is no question in my mind  
22 that cigarette smoking causes disease.

23 Q Now I'm going to refer to Exhibit 252.

24

25 THE COURT: Before you go on to a new exhibit  
26 this would be a good breaking place take the morning

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1  
2 recess  
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1 .  
2 THE COURT: Please be seated.  
3 MR. LUVERA: I neglected to introduce Jim  
4 sole doing all the work for me partner of Steve Berman  
5 .  
6 Q This is exhibit 3683 surgeon general's report  
7 preventing tobacco use among young people a report of  
8 surgeon general?  
9 A That's correct.  
10 Q This is 1989 report exhibit 3680, 25 years of  
11 progress reducing the health consequences of smoking?  
12 A That's correct.  
13 Q So this is is what a surgeon general's report  
14 looks like?  
15 A That's correct.  
16 Q Now if we take exhibit 368 0 and --  
17 If we look at this, here is a list of people  
18 that we find in this exhibit you see this?  
19 A Yes.  
20 Q And why are these people listed, please?  
21 A I think it's important to understand what a  
22 surgeon general's report is and the process by which  
23 it's developed. Surgeon general's report is the  
24 process is the document that represents the US  
25 Public Health Service position

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1 .  
2 Q Are is your Mike on hold on a second. Okay  
3 how long like that?  
4 THE WITNESS: Better.  
5 BY MR. LUVERA:  
6 Q Yes, sir.  
7 A In order to do that it has to be the position  
8 of more than one individual. So the way that a  
9 surgeon general's report is developed is we contract  
10 with the group of individuals who are very  
11 knowledgeable to write a chapter or section of a  
12 chapter on a topic they were told to review in that  
13 exception everything that is known, organization nice  
14 that and to make sure that the conclusions drawn are  
15 based on the information actually in that chapter.  
16 When they are through and sometimes we have a  
17 meeting or two with those individuals to make sure  
18 that they are doing the job correctly, when they are  
19 through they send that in to the office on smoking and  
20 health and to the editors and that's the last time  
21 those authors get to see that document. The editors  
22 then review it again to make sure that the statements  
23 contain in the document are accurate and that all the  
24 science available is reflected in the document  
25 and that the conclusions drawn are sound. It is sent out  
26 to a group of individuals other than the authors and

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1  
2 other than the editors who are knowledgeable on the  
3 specific area in question. They are usually  
4 scientists working in various research snaoufts  
5 across the United States.

6 Those individuals are asked to review I've of  
7 those chapters, send back a detailed review that  
8 describes whether all of the information available is  
9 contained in there, whether the conclusions drawn are  
10 correct, whether the inference drawn from the data is  
11 correct and whether the chapter represents the true  
12 state of our scientific knowledge.

13 Those comments come back in and again  
14 they are integrated into the chapter by the editors not by  
15 the original author.

16 The entire volume then is combined as  
17 multiple chapters and once again sent out to  
18 individuals who have a broad range of experience in  
19 public health they are asked to examine not only  
20 whether the document is complete in terms of its  
21 description of the science but also the balance and  
22 tone and the conclusions of the document as to whether  
23 they are scientifically accurate and whether they rent  
24 the consensus the scientific thought.

25 Those comments comment back in, are  
26 integrated into the chapter again by these editors and

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1  
2 the document is once again sent to each agency of the  
3 Public Health Service for their scientists to review  
4 the content of the document to make sure that it is  
5 accurate, balanced and correct.

6 Those comments come back and are integrated  
7 into the document then it goes through a formal  
8 clearance products are process where by the center to  
9 disease control, surgeon general's office, the  
10 assistant secretary for health and the secretary of  
11 health ad human services approves the document then  
12 it is released and delivered to congress which is the  
13 method by which it is released.

14 The pages that you are looking at in that  
15 volume describe the individuals who were authors or  
16 in this case reviewers of chapters on the entire document  
17 .

18 It usually represents aful of somewhere after  
19 around hundred scientists throughout the United States  
20 in addition to the agencies of the  
21 Public Health Service.

22 So this then is a document that has gone  
23 through a very comprehensive very elaborate process by  
24 which we can be certain that the information contained  
25 within it does indeed represent what the scientific  
26 community in the United States believes to be

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1  
2 scientifically true.

3 Q Would you consider this is this a highly  
4 reliable document?

5 A I think it's is an exceptionally reliable  
6 document.  
7 Q I turn to this page because I found your name  
8 that is you right there, isn't it?  
9 A That is me, yes.  
10 Q To give a flavorer of what we might find if  
11 we look here we find table action charts find  
12 historical information things that's correct?  
13 Q We would find in this particular one we would  
14 find a history of tobacco use comments about the  
15 tobacco industry and so on it's a historical review 25  
16 years of progress?  
17 A There is a section in that that looks at the  
18 history, that is correct.  
19 Q So I'm back to smoke and disease?  
20 A Okay.  
21 Q And I was referring to Exhibit 352 I'll try  
22 to make this work do you have a copy not clerk, Jim  
23 mechanic mechanic excuse me we don't have listed as an  
24 Exhibit for Dr. Burns perhaps on the list in another  
25 name we don't have this listed?  
26 MR. LUVERA: Used by me in opening statement,

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1  
2 Jim can answer that.  
3 MR. McCORMICK: We checked our list it's not  
4 been designated for the doctor.  
5 THE COURT: Then you need to move on.  
6 BY MR. LUVERA:  
7 Q Can you tell me your understanding as to the  
8 scientific organizations which believe that smoking is  
9 a cause of disease have so concluded and publicly  
10 concluded?  
11 A Is there a vast array of organizations that  
12 publicly high concluded that include the ufrmgt S  
13 public as far as, world health organization,  
14 American Cancer Society, America lung society,  
15 American Heart Association, America clerk many chest  
physician things  
16 America thoracic society, there is a very large number  
17 of organizations that have concluded that smoking  
18 causes disease and no organization with the I guess  
19 exception shun the dpak industry has reviewed  
20 this information from the last 30 years and concluded that  
21 there was not data sufficient to say that smoking  
22 caused disease.  
23 Q Dr. Burns, off record off record?  
24 Q ?  
25 BY MR. LUVERA:  
26 Q Exhibit 206, please

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12:01

1 .  
2 What are we looking at in exhibit 206?  
3 A This is a partial list of some of the 4,000  
4 plus chemical that is are contained in tobacco smoke  
5 characterized by whether they are car sib no  
6 generals whether they are organic or or inorganic  
7 compounds then a couple for example, that are listed  
8 just as compounds such as nicotine.

9 Q How do we know how do you conclude and how do  
10 those other organization conclude that smoking causes  
11 disease?

12 A The first thing that you need to understand  
13 about the way science reaches a judgment is that did  
14 doesn't reach a judgment by a single piece of  
15 information in a vacuum.

16 The way the scientific community reach  
17 sincere a judgment is by looking at all the evidence  
18 available and it looks for evidence from multiple  
19 lines of reasoning to support the same conclusion.

20 For example, in cigarette smoking look at  
21 what is in the smoke, you identify the toxicity and  
22 can anyone tell it's of chemical products  
23 smoke look at what has not to go people who smoke look  
24 at what has not to go people who have certain disease  
25 to see whether they smoke look at people who follow  
26 forward between time to see whether the rate at which

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1  
2 they get disease is different from smokers  
3 and nonsmokers earnings look at autopsy studies of  
4 people who died to see what their lungs and hearts  
5 looked like to see what they are and the take which is  
6 your major blood vessel in your and meant looks like  
7 and see whether they are different from smokers and  
8 nonsmokers look at the cells that that you cough  
9 out of your airways much as you would a Pap smear of  
10 cervix to look for cervical cancer in women you can see  
11 progression of change from the normal cells to cells  
12 that are precancerous and ultimately to cancerous  
13 cells then look at what happens when the smoke is re-  
14 moved, what happens when people quit, quit smoking.  
15 Does that smoke when it is stopped change the risk.

16 Does the risk of lung cancer change relative  
17 to people who continue to smoke when you see a change  
18 in that risk when you see a change in the cell that is  
19 people cough up to go back toward normal and and put  
20 all of that information together reviewing everything  
21 that is known, you can reach a clear solid and  
22 supportable scientific judgments that smoking causes  
23 disease.

24 The American US Public Health Service has  
25 done that conducted that review, the volunteer health  
26 agencies, heart associations lung association,

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12:01

1  
2 Cancer Society, the royal college of physician in pretty  
3 contain, Canadian college many physicians, Canadian  
4 government things various organizations of world  
5 health organizations most other national organizations  
6 almost all the health organizations that have banded  
7 to examine this issue and every single organization  
8 that has looked at this evidence in the last 30 years  
9 has concluded that smoking causes disease. That leads  
10 us to be 100 percent certain that so many eyes have  
11 looked at this it's been reviewed so many times but by  
12 so many groups with different approach that is we can  
13 be certain that cigarette smoking does indeed cause

14 disease.  
15 Q Can I get you to come down here a minute?  
16 A Sure.  
17 Q Thank you there are words to exhibit 206 I  
18 need your help see this word her what is that word?  
19 A Car sirn no general.  
20 Q You don't have a Mike is is one there?  
21 A As long as I don't sing we'll be all right.  
22 Q Pronounce the world?  
23 A Carcinogen.  
24 Q What is carcinogen?  
25 A Carcinogen rs compounds or chemicals that  
26 can cause cells to change from normal cells to cell

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12:01

1  
2 that is are cancer cells.  
3 The characteristic of a cancer is twofold.  
4 It gains the ability to invade other tissue and it  
5 loses the ability to stop growing.  
6 Normally if you cut your skin the tissue and  
7 the cells on both sides begin to grow they grow across  
8 until they cover that space that is the cut. When  
9 they touch eave other they are finished their job  
10 covered the entire surface and they stop growing.  
11 If you don't stop growing then those cells  
12 mount up and create a tumor a growth, a swelling.  
13 If that swelling continues it gets bigger.  
14 If it gains the ability to not be bound to not be  
15 contained by the structures around it but rather to be  
16 able to innocent wait itself into those structure grow  
17 into them and destroy them, then it is cancer and  
18 these are compounds that have been shown to be able to  
19 cause cancer.  
20 They are compounds in cigarette smoke that  
21 have been identified as carcinogens.  
22 This.  
23 Q This word compounds where are we  
24 talking about nicotine and acre Lloyds and so on under that?  
25 A There are approximately what the graph shows  
26 is that there are probably approximately subpoena

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12:01

1  
2 in this case, nicotine August Lloyds nicotine is a  
3 chemical contained in cigarettes it is the principal  
4 drug that people are attempting to get from cigarette  
5 smoking that's what they are attempting to ingest but  
6 there are other vary ents of that come bound that  
7 are similar that have a similar chemical corporation  
8 position that are present in cigarette smoke.  
9 There is also a variety different other hide  
10 ro car buns which sefrmgly means a come pound  
11 that contains both carbon policy laouls and  
12 kaouls has not hides yoefn month xloels  
13 also fine Noel another chemical class of come pounds  
14 45 of those. They have a different Shane to the  
15 chemical structure and they are in tobacco specific  
16 night troez means, naoits process means are a  
17 class of compnds that contain many cars seen no  
18 generals and there are six that are specific to

19 tobacco that is that are unique to tobacco products  
20 and more than one of those are have been identified as  
21 cancer causing agents.

22 Q Please tell us what this is say it out loud?

23 A Carcinogen I can inorganic compounds.

24 Q What is that?

25 A These are compounds that don't have a organ

26 in this case structure for are for example, next

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12:01

1  
2 he will arsenic had metals therefore they don't have the  
3 carbon carbon base that is typical for most of  
4 carcinogens or most of the compounds that are present  
5 from thing that is grow like a tobacco heavy or indeed  
6 or own bodies.

7 Q Read that to us?

8 A These are car sin no general I can organic  
9 compounds these are wounds of once that have a organic  
10 structure and are also involved in the carcinogen  
11 in this case process.

12 Q This word cars cars?

13 THE COURT: Cars no general in this case.

14 Q Cars cars one more time what is a layman's  
15 definition of cars cars?

16 A These are cancer causing substances.

17 Q Cancer causing substances?

18 Q Retake the chair?

19 Q I'd like to call your attention to deplan  
20 tra at the exhibit 202?

21 (At this time an off-the-record discussion  
22 was held.).

23 BY MR. LUVERA:

24 Q I'll show you 202.

25 It's not admitted yet so don't show it to the

26 jury

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12:01

1 .  
2 What does this represent?  
3 A This represents single graph which shows on  
4 an access from 1900 through about 1995 per capita  
5 consumption of cigarettes graph that I talked to you  
6 about earlier which is the consumption the average  
7 consumption of cigarettes by individuals over the age  
8 of 18 in the United States and on that same graph are  
9 white males lung cancer death rates for the years 1950  
10 through about 1993.

11 Q Is this exhibit the same as Exhibit 201 on  
12 the big poster but with the addition of lung cancer?

13 A It is the same exhibit with the addition  
14 of the lung cancer data.

15 Q It's for males?

16 A The lung cancer data it for white males.

17 Q Women I'm sorry?

18 A White males.

19 Q This document can you tell us whether it's a  
20 reliable document which will assist you in explaining  
21 your testimony?

22 A Yes this is data that comes from the US vital  
23 statistics the mortality rate for lung cancer also

24 that is that from of the US department of agricultural  
25 which is the group that tracks the production of the  
26 cigarettes in the United States

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1 .  
2 Q Offer some this exhibit?  
3 MR. McCORMICK: No objection no demonstrative  
4 pumps.  
5 THE COURT: Admitted.  
6 MR. LUVERA: So I'm clear we'll sort out  
7 of the demonstrative later I gather.  
8 THE COURT: We are.  
9 MR. LUVERA: Thank you.  
10 Q Can you please explain what this represents  
11 to us?  
12 A Well the first step in understanding the body  
13 of sign science that establishes that cigarette smoke  
14 causes lung cancer is to go back and look at lung  
15 cancer overtime.  
16 Lung cancer is now the large either cause of  
17 cancer deaths in while males, black males, white women  
18 , and black women, largest cause of cancer deaths  
19 .  
20 That disease is a disease of the 20th century  
21 . In reviews that were conducted around 1900  
22 of all of the evidence that was available on lung  
23 cancer they weren't able to say very much but what  
24 they were able to say was that this was one of the  
25 rare either cancers in humans.  
26 By the 1930s physicians who were caring for

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1  
2 parents were seeing it with an increased frequency.  
3 By the 1950s the point at which the US vital  
4 statistics data start, it was.  
5 Q Can I interrupt you do you have a pointer  
6 with your machine up there or come down whatever is  
7 most convenience?  
8 A It's easier to come down.  
9 Q I'll give you to pointer I realize that's out  
10 of focus I done my best?  
11 A The graph starts here in 1900. At this point  
12 in time lung cancer was such a rare disease that not  
13 only did the medical community recognize it as a rare  
14 disease but it wasn't even tracked as a separate  
15 disease in the US death rate table.  
16 Paragraph we began to see an epidemic of lung  
17 cancer start in the 1930s and it was well understand  
18 way by the 1950s.  
19 So the first piece of evidence that led  
20 people to wonder whether cigarettes could be the  
21 source of in this information could be the sorls of  
22 this he did democrat mention was this remarkable  
23 temporal relationship.  
24 Cigarettes weren't used in 19 up until about  
25 1900.  
26 Lung cancer was rare in 1900. We know that

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1  
2 it takes time for cancer to occur, takes five, ten, 15  
3 , 20 years of exposure to a cars cars before you  
4 develop a cancer and low and be hold 20 years later  
5 lung cancer was rising dramatically in that group who  
6 were smoernging.

7 It wasn't going up as that is in women  
8 because women until the 19340s and 1940's didn't  
9 smoke in large numbers.

10 Per capita consumption turned down beginning  
11 in the 1963 period and we're now beginning to see a  
12 decline in lung cancer death rates.

13 Well but tobacco has been with us a long time  
14 . People have been using tobacco a long time.  
15 White males have been using dpak a long time.  
16 What is different?

17 Well there is a very fundamental difference  
18 between a cigarette and other forms of tobacco use.

19 There is a story that a man fell a sleeve in  
20 a bar in the south barn curing tobacco and let the  
21 temperature get too high and it changed the nature  
22 of the tobacco leave that was stored in that barn  
23 I don't know whether that story is true but it makes a great  
24 story but the tobacco that they began to put in  
25 cigarettes was different in character.

26 It was milder, and more importantly it had an

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1  
2 aside are acid pH why would that make any difference  
3 in.

4 Well people smoked and used tobacco in order  
5 to even gist nicotine.

6 MR. KELLER: Could we have a question.

7 MR. LUVERA: Sure I will.

8 Q Explain PM afternoon the significance of it  
9 in connection with what you just said?

10 A Certainly. People ingest tobacco products to  
11 get nicotine.

12 Nicotine is a substance that if in make it an  
13 August will lie make if a base if you take away the  
14 acid can be absorbed through your mouth so if you're  
15 smoking a pipe or she gar where the smoke tends  
16 to be to be more auk lib tends not to be acid  
17 you hold that smoke in our mouth and absorb the  
18 nicotine directly across the my companies the lining  
19 of the inside of your mouth.

20 If it's acid if has a positive charge on it  
21 and it is very difficult or much more difficult to  
22 absorb across the mucus membrane. Why is that  
23 important well if you absorb the smoke around  
24 I don't know mucus membrane to get the nicotine you don't

have

25 to inhale it if the smoke is acid then you need to

26 bring it into the lung and to use the much larger ash

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1  
2 sorng shun surface big surface of the inside of the  
3 lung to deposit the smoke parcels on and absorb the

4 nicotine from the very large surface it's more  
5 difficult to absorb so you need a bigger surface to  
6 absorb if from paragraph when you inhale you bring all  
7 of those toxic and cars cars substance ns and the  
8 parcels that contain them into the lung they deposit  
9 on the lining of the lung and they are deposited there  
10 they are retained there and they are absorbed there  
11 and so the difference was that the tobacco use in  
12 prior centurys was in forms of tobacco where even if  
13 you smoked it you continued not to inhale it deeply  
14 into the lungs whereas with with a cigarette nod to  
15 get the nine nod to get the dose of nicotine that  
16 you're attempt to go receive through smoking you  
17 inhale and inhale deeply into the lungs the deposition  
18 of those cars cars in this case parcels in the lung  
19 then resulted in lung cancer occurring.

20 So it was the change in the engineered  
21 product that resulted in the occurrence of lung cancer  
22 .

23 Q I'll have you put up another chart about when  
24 did this change in the you said I was going to say  
25 design I'm not sure you said that in the way in which  
26 cigarettes was made by the way when did this happen

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1 ?  
2 A This change began in a period from about 1880  
3 through about 1900 the jet that is were produced had  
4 the different type of tobacco in it they were mild  
5 he were and will a more acid P H with the smoke hide  
6 general concentration of smoke.  
7 Q I'll show you Exhibit 203 demonstrative  
8 do you recognize that?  
9 A These are the cancer specific death rates for  
10 males in the United States from 19 3w0 through  
11 about 1994 or 5.  
12 Q Have to lay a foundation for the record.  
13 Is it based upon reliable data?  
14 A Yes it is based on the Americans serious  
15 society's report on cancer facts and figures which ask  
16 based on the US mortality data which is the death rate  
17 data for the United States.  
18 Q And will it be helpful in explaining your  
19 testimony to the jury?  
20 A Yes it will.  
21 Q ?  
22 MR. LUVERA: Offer Exhibit 203.  
23 MR. McCORMICK: We have no objection no  
24 demonstrative purposes.  
25 THE COURT: Admitted.  
26 BY MR. LUVERA:

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1  
2 Q ?  
3 (At this time an off-the-record discussion  
4 was held.).  
5 BY MR. LUVERA:  
6 Q Please explain exhibit to us doctor?  
7 A These are death rates for males from various  
8 common causes of cancer deaths. Lung, cans ter the

9 prostrate, cancer of stomach cancer colon rectum  
10 cancer of liver and pan credit I can't say and annual  
11 death rates from 1930 through 1994 or 5.

12 Q Is?

13 Q Why is this important international?

14 A The first question that would come to mind  
15 from that previous dwraf that showed lung cancer  
16 righting with per capita consumption is aren't all  
17 cancers increasing, isn't the frequency with which  
18 cancer is occurring growing in time and industrial  
19 po lungs occupational sfourls all kinds of things  
20 that could potentially cause cancer.

21 If you look at the actual US cancer death  
22 rate what you see is that lung cancer has gone from  
23 tiny number to two and a half times the next largest  
24 cause of cancer deaths among males.

25 Stomach cancer has actually been declining.

26 Most of the other cancers have been

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1  
2 relatively flat.  
3 Some increase in cancer the pan caoe  
4 I can't say so the issue is did the rise in cancer death  
5 rates and not just the common increase in all kinds of  
6 cancers.

7 Q Say that again?

8 A It's not simply a common increase in all  
9 kinds of cancers it's not that we're better at  
10 diagnosing cancer is not that we have more  
11 sophisticated tests for find out who died of cancer  
12 it's not that people are reporting cancer on death  
13 certificates more frequently, because lounge of lung  
14 cancer is going up whereas most of the other cancers  
15 are not. I believe we have a similar graph for women.

16 Q I'll put that up as soon as I show it to you  
17 here.

18  
19 (At this time an off-the-record discussion  
20 was held.).

21 BY MR. LUVERA:

22 Q ?

23 THE WITNESS: This is the same type of  
24 information for women you is see that cancers  
25 obviously are somewhat different the common cause of  
26 cancer in women including cancer the ut Russ and

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1  
2 breath and owe vary res all of which are either  
3 impossible females or in the case of breast cancer  
4 very, very unusual in males. This is cancer death  
5 rates, you can see that this line in red represents  
6 lung cancer death rates in women.

7 It goes up beginning in 1960 not beginning in  
8 the 1930s. It has now mid 1980 he clipped breast  
9 cancer as the largest cause of the cancer Beth deaths  
10 this women but this didn't go up the same way that  
11 males went up.

12 So how would you explain that, why would that  
13 , that didn't seem to make any sense well it's

14 explained by the fact that men began to smoke  
15 particularly cigarette smoke in 19 ten, 1920 period.

16 Women began to smoke cigarettes in large  
17 numbers in the 1930, 1940 period.

18 And if we can show the next graphic.

19 Q If I'm I believe?

20 A I can present that to you.

21 Q Hold on?

22 A There we go.

23 Q 205 have for lay a foundation first showing  
24 you what has been mash as Exhibit 205 what does this  
25 represent?

26 A This represents the rates of initiation among

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1  
2 cohorts for males and females between the ages of 20  
3 and 24 young adults for the years 19 ten through early  
4 1980s.

5 Q Wait a minute initiation what are you  
6 talking about?

7 A Initiation of cigarette smoke sglaog  
8 starting to smoke.

9 A This is data from the US national health  
10 interview service where we ask people or where they  
11 asked people what was the age at which you first began  
12 to smoke regularly. Went back and looked at people  
13 borne within certain calendar years so we knew how old  
14 they were and we were able to identify the rate at  
15 which they start to do smoke at different ages bus  
16 we knew the age which they start age we knew how old  
17 they were so we were able to identify going forward in time  
18 the rate at which young men and women began to start  
19 smoking cigarettes.

20 Q You said cohorts I sounds lick a couple of  
21 peop about to doing something bad what are we  
22 talking?

23 Q ?

24 A Said cohorts not cahoot sdplaos what are  
25 we talking about.

26 A Cohort is nothing more than a ground of

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1  
2 individuals followed close in time and in this case  
3 what we're talk wg is birth cohorts which simply  
4 mean people borne during specified calendar years we  
5 use five years periods in time so one borne between 19  
6 ten and 1914 would be in one cohort and the next  
7 cohort would be people borne between 1915 and 1920  
8 each of those cohorts obviously would be a certain age  
9 in a given calendar year so you were he were able to  
10 plat the age at which people began to smoke at we mov  
11 ed forward in time.

12 Q Is this based upon reliable data doctor?

13 A Why.

14 Q Will it assist you if explain your testimony?

15 A Yes.

16 Q Offer exhibit 205?

17 MR. McCORMICK: 205 presently label do not  
18 form form between the underlying data or the testimony

19 of the witness we object.  
20 THE COURT: Admitted.  
21 BY MR. LUVERA:  
22 Q We have can you explain this to us please?  
23 A This graphic splainsz why at the male  
24 lung cancer death rates went up much later in time  
25 than males lung cancer death rates you can see that by  
26 19 ten males were beginning to smoke in very high

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1  
2 percentages this is their annual frequency with which  
3 they group starts to smoke so each year five percent  
4 of these folks would start to smoke cigarettes.  
5 Women on the other hand hardly began to smoke  
6 at all until the 1930 period. And took it up in  
7 fairly substantial numbers beginning in the 1940's.  
8 So what we have now is another piece of  
9 evidence that shows that the relationship between ng  
10 cancer increasing and cigarette smoking increasing is  
11 one that is specific to the cigarette smoking.  
12 The men started smoking in 1900, 19 ten, the  
13 lung cancer start 20 years later in 1930 the women  
14 began to smoke 1930, 1940, they are lung cancer rates  
15 began to increase in 1960 so we had the same  
16 relationship and again that would be truly remarkable  
17 if it were explained by anything like increase ability  
18 to make a diagnosis or better rates of autopsy or more  
19 specific diagnostic capabilities on the part of  
20 medicine.  
21 Q So conclusion from these study that is you  
22 have drown is what?  
23 A The conclusion is that when you look at the  
24 overall picture of what is going on in the  
25 United States is a very strong suggestion that the lung  
26 cancer epidemic that we were seeing was indeed related

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1  
2 to the up surge in cigarette smoking that had occurred  
3 earlier.  
4 Q Retake your chair, please?  
5 Q I got to ask you questions I don't want to  
6 ask about epidemiology I can studies prosecretary  
7 pif retrospect active and dose response studies see  
8 if you can translate it into something I can  
9 understand so can you explain those terms to us please  
10 ?  
11 A Well let me start from zero. If you had  
12 this information and you were concerned as the scientific  
13 community was we're seeing an epidemic of lung cancer  
14 what would you do how would you try to figure out  
15 what wasusing it.  
16 Well probably the first thing that would come  
17 to mind is you would collect a ground of people that  
18 had lung cancer and you would come pair them to to  
19 group of people who didn't have lung cancer and you  
20 would see what the differences are.  
21 That was done.  
22 That is called a retrospect active study  
23 because the people already have the disease and

24 you are looking backwards in time to see what  
25 characteristics mit have caused the disease.  
26 There are now more than a hundred retrospect  
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1  
2 active epidemiology I can studies that looked at lunch  
3 cancer. Patients with lung cancer compared with  
4 people in the hospital as controls compared with other  
5 types of controls people in their own community  
6 et cetera what you find is that the people with lung  
7 cancer are much more likely to be smokers than the  
8 people in the general population.

9 And more interestingly you see that they are  
10 much more likely to be heavier smokers than people  
11 in the general population.

12 So having seen that having established that  
13 fact for patients with lung cancer, you would really  
14 like to know what happens going forward if time.

15 THE COURT: Before you.

16 Q Before you do that can I interrupt?

17 A Sure.

18 Q In the case of a retrospect active study,  
19 would it be close to being correct to say that you in  
20 effect collect the charts or medical records of people  
21 that you have received treatment of some kind and you  
22 study them to patterns of some kind?

23 A Yes.

24 Q That's people already treated and have record  
25 the?

26 A That's member who have already been treated

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1  
2 or people who have already been diagnosed with the  
3 disease.

4 Q Prospective constitution difficulties?

5 A Well what you then need to do is look forward  
6 in time you would like to know that this wasn't some  
7 different reference in memory of people who had lung  
8 cancer. So what you do is take a group of people  
9 launch group of people who don't at the time you start  
10 have anything wrong with them. They are smokers  
11 they are nonsmokers billing, fat, short issue tall, thins,  
12 all kinds people, when, wifm, white, black, his  
13 pan in this case, nonbusiness his span in this case  
14 all kisses of people age follow them forward in time.  
15 You start and ask them how much they smoke, when did  
16 you start smoking, series of questions about smoking  
17 and you look at them then forward in time prospective  
18 ly to see who gets lung cancer. And what  
19 you see is the people that smoke get lung cars serious  
20 at about ten times the rate of people who don't smoke.

21 Then you look no what is called a dose  
22 response relationship.

23 Q Witness a minute before you go to that  
24 perspective study can you tell us whether a  
25 perspective study would involve following a group of  
26 people over time

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1 ?  
2 A Yes.  
3 Q People who agreed to be part of a study  
4 perhaps?  
5 A That's correct.  
6 Q And then you check on them and see what is  
7 happening to them over time?  
8 A Yes.  
9 Q Go ahead dose response then?  
10 A So what you are doing is following this group  
11 of people to give you an example the largest study  
12 that was done was the and there were two of them  
13 done by the Americans serious society where they  
14 followed a million member and they followed a million  
15 people in the first study to 12 years. Following them  
16 forward in time and reporting what diseases they died  
17 of, and reporting changes in their smoking behavior  
18 during that time along with a lot of other  
19 characteristics like age age various other  
20 characteristics.  
21 There are now prospective study that is very  
22 followed a follow of I believe about 3 million people  
23 for a total of 30 million years of observation, 30  
24 million person years of observation, one person followed  
25 for one year.  
26 So now you look at that data and you see that

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1  
2 smokers have ten times the rate of cancer lung cancer  
3 as known smoke ergs so the question is if this is  
4 caused by the smoking, then people who have more  
5 exposure should get more disease and member who have  
6 less exposure should get less disease I believe  
7 we have a graphic though that shows now you do that the  
8 easiest way a measure how much you smoke and all of  
9 you have done that with other folk at various time is  
10 you ask them how many cigarettes per day do you smoke  
11 and it's a reasonable expectation that someone that a  
12 group of people who report that they smoke two packs  
13 of cigarettes a day inhale and deposit in their lungs  
14 more smoke than a group of individuals who say they  
15 only smoke half a pack per day.  
16 And so what you do is you take and you  
17 separate out those groups and look at the folks who  
18 said at the start of the study difficult we smoked one  
19 to ten cigarettes per day or one to nine, ground that  
20 said this that they smoked between half a pack and a  
21 pack, folk that is they smoked a pack says the folks  
22 who said they smoked more than a pack and the  
23 folks who smoked more than two packs and if we could.  
24 Q I want to finish undoegs response?  
25 A Okay.  
26 Q Have you completed

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1 ?  
2 A Yes.  
3 Q Would it be roughly correct if  
4 you are talking about dose response if we were measuring

5 alcohol one opinion has one drink somebody else has  
6 two smublg has four?  
7 A That's correct.  
8 Q And your analyzing effect?  
9 A That's correct.  
10 Q afnl I roughly on track?  
11 A Yes roughly also on track with the fact that  
12 while individuals may have some differences some  
13 people may be very confuse the and and appear drunk on  
14 two drinks other member may be representatively  
15 coherent on four, five, circumstance drinks if you  
16 take a dpraoun of people who have one to two  
17 drink answer compare with a ground of people who have  
18 five to saoiks drinks the ground of people who  
19 have had five to six are going to be much more drunk  
20 so while there may be some individual varying aigs  
21 when you look at it as a group you can be certain that  
22 the effect is greater in the people who have had the  
23 higher exposure.  
24 Q I'd like to call your attention to  
25 demonstrative exhibit 207, please.  
26 Can you tell us I think the easiest way to do

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1  
2 it I'm not sure maybe with the pointer explain this  
3 exhibit to us?  
4 A Okay. This is a graph that is ground from  
5 one the largest prospects fifth studies of American  
6 serious society cancer provengs shun study one  
7 followed over a million men and women for 12 years for  
8 11 million person years of observation, this is data  
9 for males. What it does is it takes the number of  
10 cigarettes per day reported by people at the start of  
11 a study, so when they first enrolled they were asked  
12 how many cigarettes a day do you smoke some of them  
13 smoked less than, half a pack per day, one to nine, 20  
14 cigarettes in a pack, some smokinged between ten and  
15 19, the most common response usually for a single  
16 number is 20. People say I smoke a pack per day.  
17 Some folks said they smoked 21 to 39  
18 cigarettes per day and some folks said they smoked  
19 more than two packs per day.  
20 So that is at the start of the study.  
21 Then what you do is follow those people  
22 forward in time and you compare the frequency with  
23 which they die of lung cancer in comparison to non  
24 smokers of the same age and that generates what is  
25 called a relative risk.  
26 The death rate if people who smoke as a ratio

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1  
2 or in relation to per death rate of people who don't  
3 smoke.  
4 When we look at that we see that going are  
5 going forward in time people who total us before they  
6 had any diagnosis whatsoever that they smoked one to  
7 nine cigarettes per day had about 3 point 8 or 3 point  
8 nine times the rate of developing and dying of lung  
9 cancer as member who can't smoke.

10           When you look at people who smoked between  
11 half a pack and a pack, it's up to about 8 fold.  
12 Paragraph when you look at people who report a pack,  
13 it's up to about 12 times.  
14           So the people who reported that they smoked  
15 wunl pack of cigarettes per day died of lung cancer  
16 at 12 times the rate of people who never smoked  
17 cigarettes.  
18           When you get out to 21, more than a pack but  
19 less than two packs 2 21 to 39 yets a day Yee  
20 you're up to 15 to 16 range and by the time you get  
21 out to two packs a day you're up in the 18 or 19 range  
22 .  
23           People who smoke two pack were 3er day  
24 were dying of lung cancer at 19 times the rate at  
25 which people never smoked cigarettes died of lung  
26 cancer

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1 .  
2           You can also look at dose in a couple of  
3 other case are ways you can look at how long people  
4 smoked. Because that's another measure of the  
5 cumulative effect of the inhalation of these cars cars  
6 day after day on the lung.  
7           When you look at the length of time people  
8 smoke you see a steady increase in the risk of lung  
9 cancer fl 20 years of smoking to 25 years, 30  
10 years, 40 years it keeps going up.  
11           You can also look at the age at which someone  
12 started to smoke.  
13           The earlier you start, the more you have been  
14 exposed to tobacco at any given age.  
15           The earlier you start, the higher your risk  
16 of developing lung cancer.  
17           So when you look at the me situation with  
18 which smoking is related to lung cancer death rates  
19 and you look at it by number of cigarettes and look at  
20 it by how long you have been smoking when you look at  
21 it by when you started to smoke, all of those show  
22 increasing risks in those with higher exposure to the  
23 smoke so we're now very comfortable that this  
24 relationship is a relationship between the smoking  
25 behaviors and the occurrence of the lung cancers.  
26

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1  
2           Q       Would it be an oversimplification to say the  
3 more you smoke the greater your chance the cancer when  
4 you look at that chart?  
5           A       No that is.  
6           A       That is klaoirlt the message the longer  
7 you smoke the more you're add risk of developing lung  
8 cancer.  
9           Q       I'll show you deMonday tra different  
10 exhibit 208.  
11           Ask you explain this to us, please?  
12           A       Certainly. This is the risk when you stop  
13 smoking. If the disease is caused by the exposure and  
14 if the risk of the disease goes up when you increase

15 the amount of exposure when you quit smoking the risk  
16 or the amount of four in the people who have quit  
17 decreases decreases relative to people who continue to  
18 smoke.

19 So if we want to know with confidence that  
20 the risk is caused by cigarette smoking then we  
21 ought to see that risk change as people stop smoking.

22 So this graph is again from the Americans  
23 serious society study of the million people but it  
24 looks at the risk in people who stopped smoking for  
25 various periods of time, two for four years, five to  
26 nine, ten for 14, 15 to 19 and 20 to 24 years and it

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1  
2 looks at the at their risk of the lung cancr relative  
3 to individuals who never smoked.

4 Again the people who have no exposure to  
5 cigarettes. This is the risk in people who continue  
6 to smoke. And it takes quite a bit of time before  
7 stopping smoking alters your lung cancer risk. The  
8 reason for that is that when you very, very a cancer  
9 forming process in your lungs the step at which it  
10 becomes irreversable is the point at which a single  
11 cell develops the ability to invade and loses the  
12 abilities too stop growing it becomes a cancer.

13 There is a long period where that cell  
14 continues to grow and if grows steadily month after  
15 month after month until it getting large enough to  
16 make you sick make you symptomatic to cause you to  
17 cough problems then you go see your doctor and get a  
18 diagnosis doctor takes a biopsy and says you have  
19 lungs cancer but you don't die that day, you die  
20 sometime in the next months to a couple of years.

21 So on average from the time that you make  
22 that trabs form making of a single cell to the time  
23 you die and therefore would be reported as a lung  
24 cancer death in these date it is about three to 3  
25 and a half years.

26 So when yes we get to the two to four year

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1  
2 period we're looking at the first time when we might  
3 expect to see any dpe client.

4 Continuing smokers again are up here 13 or 14  
5 times, the risk, by the time you are out five to nine  
6 years by the time when all those cancers that had been  
7 in place at the time that you that people quit have  
8 already manifest themselves and people have died of  
9 them and you are looking at the rate of new cancer  
10 occurrence you see it's lower it's gone down to about  
11 nine.

12 Go taught to ten to 14 xwraoers and see  
13 it's gone down further.

14 By the time you get out to 15 to 19 years  
15 down to about 3. So now your risk is about  
16 three times of risk of someone who has never smoked  
17 unfortunately even when you get long after your  
18 cessation there is still a small residual effect of  
19 all of that cars cars in this case exposure that

20 occurred while you're smoke and your risk remains  
21 about twice that of someone who has never smoked  
22 cigarettes.  
23 But what we have now is very clear and come  
24 Meling demonstration that not only does the exposure  
25 to lung cancer very is closely relate to the  
26 occurrence of the lung cancer on the upstroke but that

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1  
2 cessation of cigarette smoking also relates very  
3 closely to lung cancer with cessation and the longer  
4 you're off, the lower your risk relative particularly  
5 to people who continue to smoke.

6 Q Thank you retake your chair.

7 When we talk about the connection between  
8 smoking and lung cancer terms such as cause or  
9 association can be used is that correct?

10 A Yes.

11 Qs causes may come up can you explain to us what  
12 those words mean when we talk about are these two  
13 connected to each other?

14 A In any epidemiology I can or for that matter  
15 in any scientific study you can have two things that  
16 occur together. You get up every morning, the sun  
17 comes up every morning. So the question then is  
18 are you causing the sun to come up or is that just an  
19 association that occurs.

20 So the demonstration that two things occur  
21 together is an association.

22 For example, when we looked at the lung  
23 cancer death rates in the United States and the change  
24 in cigarette consumption in the United States we see  
25 an association between those two.

26 Having demonstrated that the two track

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1  
2 together, you then need to move to the next step which  
3 is to stay does one cause the other.

4 And while there probably have been people  
5 in this world who thought that the sun came up because  
6 they got up in the morning that is not something  
7 that the scientific community believes causes the sun to  
8 come up in the morning.

9 So how do we sort that out?

10 One well one to sort if out is to examine the  
11 kind of detail data you have just seen. If the data  
12 tracks very closely as it does with the amount of  
13 exposure and the duration of exposure when you control  
14 for other factors when you look at people with family  
15 histories of cancer and you see that the smokers still  
16 get more cancer than the nns smokers when you look at  
17 people who work in urban environments and people who  
18 live in rural environments and see that the memo?  
19 Urban inch environments who get lung cars serious are  
20 still smokers and penal who get cancer in rural  
21 environments are still smokers that when you look at  
22 member with different ouns you see that the  
23 smokers still get higher rates of lung cancer in owns  
24 es so you now have this very close relationship

1  
2 look at things like diet look at things like where  
3 people live, when you will be at how old member are  
4 when you look at the different occupy occupypings that  
5 fell have, when you look at twins you find that it is  
6 the smoker who is at higher risk of developing lung  
7 cancer.

8 The next step then is to look at other  
9 sources of data. What happens with the celgs of  
10 people who smoke and don't smoke when you look at them  
11 ? What you see is that people who inhale as  
12 smokers have more changes in the cells that line their  
13 airways than member who don't smoke.

14 And you can see that when they stop smoking  
15 those changes reverse.

16 You look at what is in the smoke to see where  
17 the compounds there are capable of causesing this  
18 disease you expose and hals no those compounds  
19 expose animals to smoke and you smoe that the smoke  
20 itself can cause disease on the skin l and mafles  
21 put all of these lines of evidence together then  
22 you're able to say this is not simply an association,  
23 this smoking behavior causes the occurrence of lung  
24 cancer.

1  
2 I need to now ask you about changes that occur in the  
3 lung as a result of cancer and you have charts I'd  
4 like to start with two are 209, if I could. If I  
5 could get you to come down to 209, please?

6 A Well I'm I'm traoin too lung disease and  
7 you should therefore expect that I'll have a bias that  
8 I think the lung is really a neat organ I think it's a  
9 wonderful structure of the as most of you know very  
10 large structure contains the contained incise inside  
11 the chest and bring the areas into that structure true  
12 a series of tubes those tubes are called bronchi or  
13 the trachea the trachea is the big first tube then  
14 after they branch they bfrk chronic guy bronchi  
15 those tubes are lined with cells and there is a  
16 purpose behind that lining. The pump is to protect  
17 you from all of the stuff that you inhale. As we have  
18 evolved will you history we were exposed to dusts  
19 fires respect all kinds of things we inhaled things  
20 into the lung that the lungs didn't want to have there  
21 and so what happens is the structure of the lung  
22 developed this way. To produce produce a series of  
23 these cells that there are that are tall thin cells  
24 that have the little hair like structure on to tonight  
25 of them they are called Sylvia and on top of that  
26 Sylvia sits a very thin layer of water and mucus

1 .  
2 What happens to protect the lung is those  
3 dust part culls you inhale land on to which mucus and  
4 these Sylvia move that mucus and carry it up out of  
5 your lungs and dump it in to the back of your throat  
6 where you swallow it it protect the lung cleans the  
7 lung and saves the lung from being expose to see these  
8 toks iks substance thing.  
9 These cells are like the cells of your skin  
10 they get throne off about every 24 hours and you make  
11 new once.  
12 So if you damage one of these if the cars  
13 cars in the smoke gets in and attacks the knew  
14 klaoe yous here it doesn't make any difference  
15 because that cell is December continued to be cast off  
16 by the body any wraif anyway so this protects the  
17 lining of cells of the airway it is these cells down  
18 here that need the protection from the cars cars.  
19 They are dividing and changing August the time.  
20 They are the cells that are going to day with the body they  
21 produce and grow into these larger cells but they are  
22 there for your entire lifetime.  
23 So what happens then when you start to smoke?  
24 The next.  
25 Q Go back please before you do that.  
26 Before you go to the next one, these, this

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1  
2 triangular shaped things are cells?  
3 A Yes.  
4 Q These round things are the knew kle just?  
5 A Yes the cell the part of cell that controls  
6 the genetic material D NA in the cell that causes it  
7 to replicate and reproduce the information that codes  
8 for all of the development of that cell.  
9 Q This upper thing is also a cell?  
10 A Yes.  
11 Q Do these things have names?  
12 A Those are calls coLum near epithelial cells.  
13 Q Sorry I asked the ones down her at the bottom  
14 are the ones that stay?  
15 A Those are called base sal cells or base  
16 salg similar cells.  
17 Q Next whibts is 2 ten thank you?  
18 A Well the smoke that you inhale any of you  
19 whoever smoked a get will remember that your first  
20 cigarette was probably pretty irritating when you ill  
21 inhaled you probably coughed that is because the lung  
22 has a protective reflect the cough to bring that stuff  
23 up to prevent you from inhaling things that irritated  
24 the lung.  
25 And there are a number of very potent air  
26 tents in the smoke. What p happens when you inhale

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1  
2 the smoke is those smoke marms depost on the ton  
3 on to have the Sylvia but there are several compounds  
4 in the smoeblg that pair lies those hair like structures and  
keep them from moving.

5           They prevent the normal clearance of those  
6 particles out lung so the Sylvia stop moving, parcels  
7 are sitting on top of that lining the normal response  
8 of a body for repetitive irritation is to change the  
9 motion common experience we all have of that is the  
10 building of up of callus on our hands and neat some of  
11 us on our butt but that is a thickening or a change  
12 in the normal cells of the skin. If you repetitively  
13 expose the lung to any it tent.

14       Q       Any irnts tent?

15       A       Any it tint any substance take continuously  
16 irritates it over a long period of time the stublgt  
17 tur the cells chain and any become these square like  
18 cells it's almost as if the cells are hunching down to  
19 protect themselves fl thater tent but they know  
20 longer counter Sylvia on top paragraph of now this  
21 doesn't occur in every cell all across the lining of  
22 every airway, it occurs in patches. But those patches  
23 interfere with the clearance of the lung and the  
24 removal the smoke parcels so now the smoke parcels get  
25 to sit her no to longer period of time, get to dis

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2       solve and get to work their way down to these cells  
3 that are dividing and replicating and are going to  
4 stay around the entire life time the individual.

5           The cars cars present in the tobacco smoke  
6 are able forget from up there at the top of the airway  
7 down into the cell and into the D NA, into the new  
8 klaoe yous of the cell, into the memory that  
9 divides the cell and produces another normal cell just  
10 like it and was able too get in.

11           That process occurs over a substantial period  
12 of time, it may take 2, 3, 4, five years or locker  
13 before you begin to see these changes in the airways.

14           The other change that occurs is the lung  
15 begins to make much more mucus. And any of you who  
16 have known to heavy smoker who smoked for 40 or 50  
17 years now know they are what is called smokers cough  
18 where they are constantly coughing up stuff up out of  
19 of the lung that is the extra mucus the lung make a an  
20 effort to protect is lfr in the repetitive  
21 exposure of the smoke.

22       Q       Sigh you at